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Golden Gate Corridor Transportation Facilities Plan

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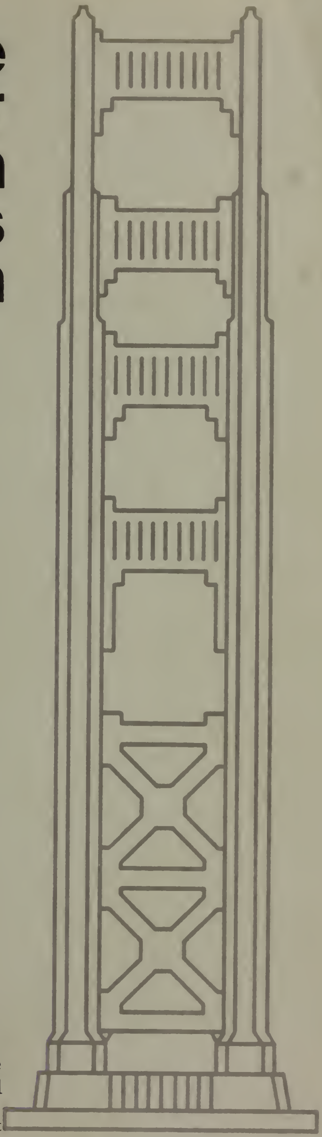

Report to
California State Legislature
April 3, 1971

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Golden Gate Bridge, Highway and Transportation District

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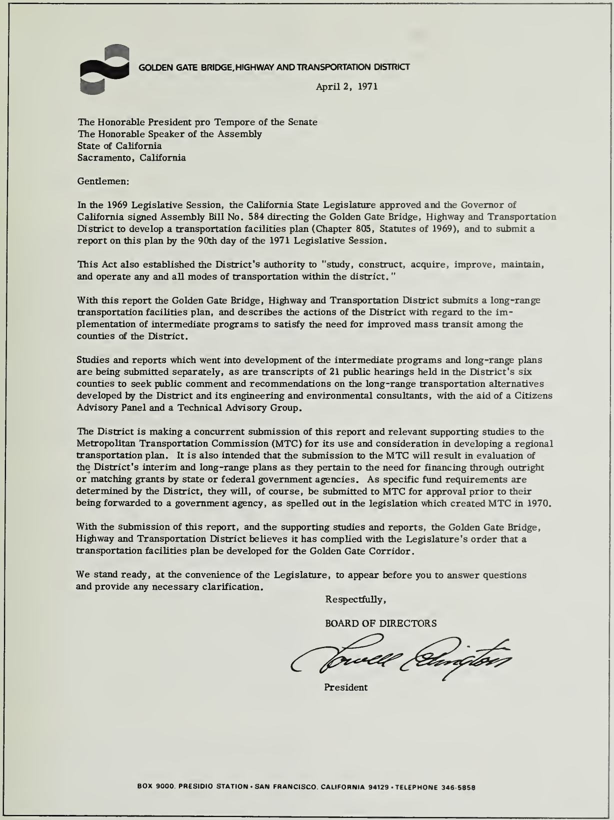

GOLDEN GATE BRIDGE, HIGHWAY AND TRANSPORTATION DISTRICT

April 2, 1971

The Honorable President pro Tempore of the Senate
The Honorable Speaker of the Assembly
State of California
Sacramento, California

Gentlemen:

In the 1969 Legislative Session, the California State Legislature approved and the Governor of California signed Assembly Bill No. 584 directing the Golden Gate Bridge, Highway and Transportation District to develop a transportation facilities plan (Chapter 805, Statutes of 1969), and to submit a report on this plan by the 90th day of the 1971 Legislative Session.

This Act also established the District's authority to "study, construct, acquire, improve, maintain, and operate any and all modes of transportation within the district."

With this report the Golden Gate Bridge, Highway and Transportation District submits a long-range transportation facilities plan, and describes the actions of the District with regard to the implementation of intermediate programs to satisfy the need for improved mass transit among the counties of the District.

Studies and reports which went into development of the intermediate programs and long-range plans are being submitted separately, as are transcripts of 21 public hearings held in the District's six counties to seek public comment and recommendations on the long-range transportation alternatives developed by the District and its engineering and environmental consultants, with the aid of a Citizens Advisory Panel and a Technical Advisory Group.

The District is making a concurrent submission of this report and relevant supporting studies to the Metropolitan Transportation Commission (MTC) for its use and consideration in developing a regional transportation plan. It is also intended that the submission to the MTC will result in evaluation of the District's interim and long-range plans as they pertain to the need for financing through outright or matching grants by state or federal government agencies. As specific fund requirements are determined by the District, they will, of course, be submitted to MTC for approval prior to their being forwarded to a government agency, as spelled out in the legislation which created MTC in 1970.

With the submission of this report, and the supporting studies and reports, the Golden Gate Bridge, Highway and Transportation District believes it has complied with the Legislature's order that a transportation facilities plan be developed for the Golden Gate Corridor.

We stand ready, at the convenience of the Legislature, to appear before you to answer questions and provide any necessary clarification.

Respectfully,

BOARD OF DIRECTORS

Lowell Edington

President

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District Engineer

Reader's Guide

The report of the Golden Gate Bridge, Highway and Transportation District to the California State Legislature answers to the Legislature's Assembly Bill No. 584, effective November 10, 1969.

The table of contents on the next two pages is a thumbnail summary of the sections that follow. For readers who wish initially to read only specific aspects of this report, the Summary and Contents will guide you to those sections of immediate interest.

The District's recommendation for a long-range Transportation Facilities Plan begins on Page 41, and for easy reference, it is printed on gray paper stock.

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Golden Gate Bridge,
Highway and
Golden Gate corridor
transportation
1971.

Open Fold

The Five Alternatives. 30

The consultants and advisory groups analyzed the five alternative concepts for long-range transportation facilities. They weighed types of systems, costs, patronage, and environmental and socio-economic impacts. These were all related to projections of population and employment. The systems ranged from exclusive busways and fixed guideways on a transit deck of the Bridge, to fixed guideways in tubes under the Bay. All the systems had a southern terminal in San Francisco's central business district, interfaced with BART. When the comprehensive data was completed, the District published summaries, and the material was furnished to the public prior to and in the course of public hearings.

The Public Hearings. 36

To involve District communities and citizens in the planning for transportation facilities, the District Directors took the five alternatives directly to the public in a series of 21 hearings in six counties, conducted along the line of town meetings. Over 1,200 citizens took an active part in these dialogues; transcripts of comments, questions, and suggestions were made. The participation of citizens contributed valuable insights. When the hearings concluded early in February, 1971, Bridge Directors, staff, consultants, and Citizens Advisory Panel reviewed the public comments, and set about formulating a recommendation to the Legislature, with the goal of a balanced, coordinated transportation facilities plan.

The District's Recommendation. 41

The District project staff and its consultants felt strongly both the public concern about rigid, immutable plans, and their own conviction that the future planning and implementation must have a reasonable degree of flexibility. At issue were community environmental values, financial feasibility, and a changing transportation technology. The problem boiled down to: how to advance significantly without sacrificing flexibility?

Along with continued implementation of interim bus, ferry, and Bridge systems, the District recommends: A 10-year plan to implement a longer-range program to improve public transportation and at the same time "position" the District for later options. It is a phased program whose major elements are: ☐ Adaptability of rights-of-way either to busways or fixed guideways for train or train-like vehicles ☐ Underground route in San Francisco, terminating in central business district and interfacing with Muni and Bay Area Rapid Transit (BART) ☐ Construction of two-lane transit deck on Golden Gate Bridge, according to engineering studies calling for use of existing understructure without altering Bridge profile ☐ Use of buses as initial mode of transit ☐ Research and development of transit vehicles ☐ Working out of routings with local agencies ☐ Acquisition of agreed-upon rights-of-way ☐ The goal of a multi-modal, balanced public transportation system, with the District continuing as a sub-regional agency responsible for coordinated development and management.

Appendices. 55

Bibliography of studies, reports, and references. Acknowledgements.

Summary and Contents

The Charge and the Challenge. 5

The enactment of Assembly Bill No. 584 in 1969 by the California State Legislature and the Governor of California charged the Golden Gate Bridge, Highway and Transportation District with the responsibility of confronting, with action and planning, the growing traffic congestion in the Golden Gate Corridor. The most challenging and sobering statistic: traffic volume on the Golden Gate Bridge and its approaches has grown from 3½ to 33 million vehicles a year since the Bridge opened, though the Bridge's traffic capacity is adequate for only 25 million. The daily average of traffic volume now reaches past 90,000. This congestion is a growing obstruction to the area's economic and environmental welfare.

The Bridge District in History. 8

The Golden Gate Bridge District was formed in 1928, comprising all of San Francisco, Marin, Sonoma, and Del Norte Counties, most of Napa County, and part of Mendocino County. After years of inaction by State and Federal levels of government, the citizens of the District took the risks and invested the funds that made the Bridge a reality. The Bridge's opponents and detractors said "it could never be built." It was opened to traffic in 1937 and has operated successfully and solvently ever since, quickly becoming not just a world-famous landmark, but a vital artery of livelihood, recreation, commerce and communications between San Francisco and the Redwood Empire counties to the north.

Managing the Traffic. 10

Growth in population, suburban commuting, and recreational travel have been key factors in traffic pressures on the Golden Gate Bridge. Before and since its 1969 legislative mandate, the Bridge District has moved steadily forward to provide interim solutions, and the foundations of long-range solutions, for the transportation squeeze in the Golden Gate Corridor: reversible lanes, one-way tolls, reduced bus tolls, a stronger Bridge structure, studies of Bridge capacity. Studies were made of Bridge expansion, and plans were made for speedier toll collection through toll plaza modernization. Then, under the new authority granted by the Legislature, studies and implementation of new public bus and ferry systems were initiated.

Interim Golden Gate Bus System. 12

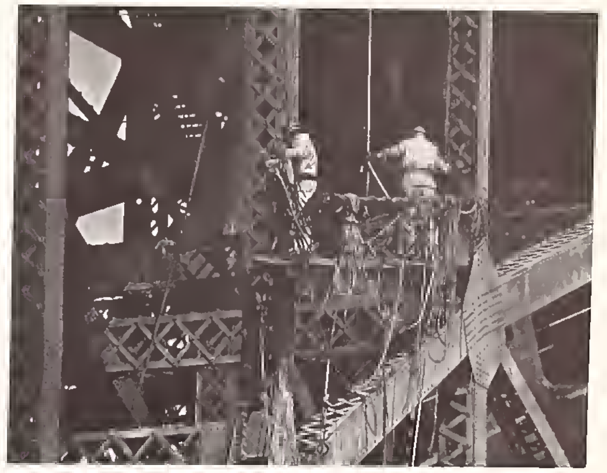
Following the studies started in 1965 by the Marin County Transit District (MCTD), the Bridge District in 1969 was given the function of implementing MCTD's studies and goals to establish a "home to work" commute bus system. With the assistance of a citizens committee, strict criteria of rider comfort, visual quality of vehicles, anti-pollution standards, and day-round scheduling were established. Specifications for 152 buses were ready for bid on March 17, 1971. Initial operation of the interim Golden Gate Bus System is expected to begin in late 1971. Meanwhile, the District is operating two feeder bus systems serving ferryboat ports, and a local service in Central and Northern Marin County.

Fleet Ferry System. 16

Passage of A. B. 584 enabled the Bridge District to act at last upon the entreaties of the San Francisco and Marin Boards of Supervisors, and of numerous communities and civic groups, to study and inaugurate a public ferryboat service between Marin County ports and San Francisco. Envisioning a service integrated in a balanced public transportation system, the Bridge District plans call at the outset for four new 25-knot ferryboats, with the ferry landings in San Francisco, Sausalito, and Central Marin served by feeder buses and shuttle-service parking. The District ferryboat in operation from Sausalito in six months carried over 350,000 passengers, equivalent to about 260,000 automobiles on the Bridge.

The Bridge System. 20

Through a constant program of inspection, maintenance, and repair, the Golden Gate Bridge has remained a model of safety and strength. A lateral bracing system below the Bridge thoroughfare was completed in 1954, greatly increasing the Bridge's strength and durability. An extensive engineering study completed in 1968 commended the Bridge's maintenance program and recommended only one major renewal project: replacement of the vertical suspender cables and their connection to the span deck. First stage of this work will begin in 1971. With its renewal completed, the Bridge's life span can be projected beyond 200 years! Toll plaza modernization is also being done, to speed auto travel.



The Question of a Transit Deck. 24

A series of studies of the Golden Gate Bridge—dating back as far as 1961—added up to a number of conclusions about the Bridge's capacity: a transit deck could not sustain the type of system proposed by Bay Area Rapid Transit (BART) without risk of shortening the life of the structure, but could support four lanes of light vehicular traffic or a relatively lightweight transit system such as more recent designs and technologies are developing. Because the lateral bracing system installed in 1954 already provides the framing for incorporating a lower deck, the Bridge's famous profile and general appearance would be virtually unchanged by the addition of a lower deck for transit only.

Transportation Facilities Study Program. 26

The programs and progress of the Bridge District in the 1960s were the context in which the District, following its legislative mandate, undertook studies to develop a long-range transportation facilities plan. To insure a planning program with maximum public involvement, the District established a study team made up of two prime consulting firms—engineering and environmental—and two advisory groups, one of interested private citizens and organizations, the other composed of professional representatives of governmental agencies. Together, they reviewed earlier studies and concepts, narrowing the study's scope from 25 concepts down to five alternatives, and spent a year completing the study.

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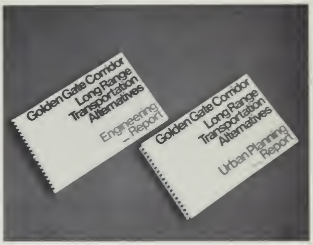

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The Charge and the Challenge

Each weekday morning the Golden Gate Corridor stirs brutally to life. First hundreds, then thousands, then thousands upon thousands of automobiles make their way up and down the ramps onto U. S. Highway 101 in Marin and Sonoma Counties and work their way toward San Francisco.

The cars converge at the Golden Gate Bridge, nudge their way across, and then descend onto the streets of San Francisco's Marina District and on into the downtown business area. At the end of the day it all happens in reverse. The same push, the same crush, the same precarious, wasteful, polluting congestion.

This, of course, is a simplification. Not all the cars are going to and from Marin and San Francisco. They are driven to and from all the other counties of the Bay Area, too. On weekends, the northern redwood country and wine country and beach country receive and return a multitude of automobiles, crowding the Golden Gate Corridor, pressing upon the Golden Gate Bridge with hours of bumper-to-bumper congestion.

This crowding, this congestion is a growing obstruction to the future economic and environmental welfare of the Golden Gate Corridor and, by relation, its neighboring counties.

Auto traffic in the Golden Gate Corridor already exceeds highway capacity at times. The Marin Balanced Transportation

Study predicts that if no alternative forms of mass transportation are developed, during the next fifty years the number of highway lanes will have to be increased and increased some more — until by early in the next century U. S. 101 north of the Bridge will need eighteen lanes to handle the automobiles.

History shows it is unrealistic to "do nothing." To do nothing doesn't retard the growth; it only increases the congestion. In the 1960s, for example, nothing major was done to improve transportation facilities or to increase highway capacity in the Marin County portion of the Golden Gate Corridor. Yet in Marin, the 1970 census shows that the number of automobiles jumped by over 73%, from 62,000 to 108,000, in those ten years.

In the Golden Gate Bridge's first full year of operation — 1938 — about 3½ million vehicles moved across it. By 1969, the annual traffic volume had reached over 32 million. From a traffic average of 9,000 vehicles a day in 1938, the daily average had grown to about 90,000 by 1969, with the concentrations during peak commuting hours and on weekends and holidays.

Before 1969 and since, the Golden Gate Bridge, Highway and Transportation District took many steps to accommodate the growing traffic, and these measures are described later in this report.

In August, 1969, in just one example of the concern with the urban-suburban environment and the general quality of life in our state, and in recognition of the Bridge District's transportation responsibilities, the California State Legislature passed Assembly Bill No. 584. The act was signed into law by the Governor of California on August 22, 1969, a little more than a year and a half ago.

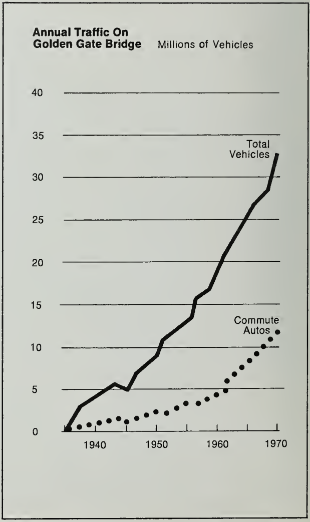
In essence, the Legislature's 1969 act mandated the Bridge District to develop a transportation facilities plan, defining the District's future responsibilities for providing transportation services in the Golden Gate Corridor.

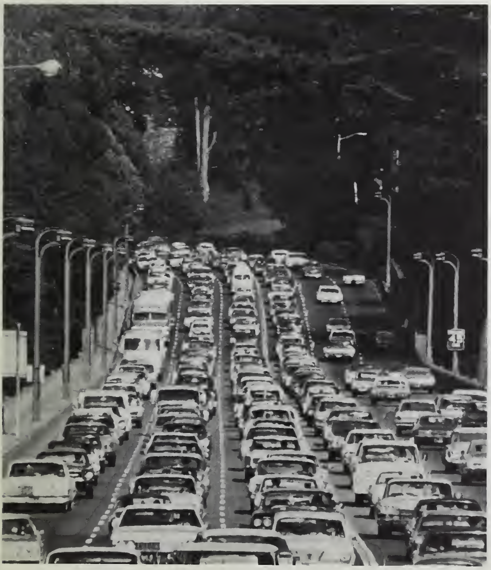
The act explicitly established the District's authority to "study, construct, acquire, improve, maintain, and operate any and all modes of transportation within the District, including, but not limited to, water transportation . . ."

Providing additional guidelines, the act also addressed itself, and asked the District's response, to other issues related to the development of transportation facilities and to the organization of the District itself.

Our report, therefore, is necessarily not just a recommendation for future transportation facilities, but also an account of how the Bridge District has met its challenges and fulfilled its trust as a transportation agency representing the citizens of six counties and responsive to the people and the problems of an entire region.

We think this account—and this accounting—is a healthy process for the District and the people it serves. Certainly any government institution needs periodically to look closely at itself, review its accomplishments and renew its perspective, restate its principles and reset its goals.


Annual Traffic On Golden Gate Bridge



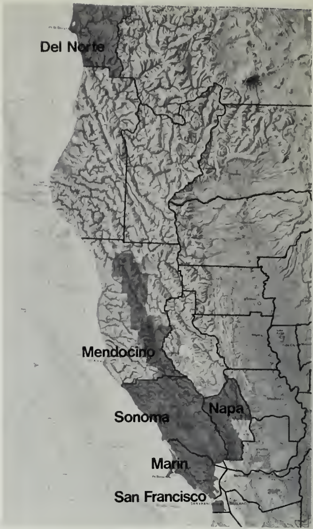
The Bridge District in History

"What is past is prologue." The history of the Golden Gate Bridge is pertinent to some of the judgments which the California Legislature will make.

During World War I, with more automobiles coming into use, traffic between San Francisco and the counties to the north began to grow quickly. The only link then was by ferry, and on holidays and weekends roads leading to the ferry piers were jammed for miles by lines of motorists.

Public officials in the counties to the north and in San Francisco realized something had to be done. In 1918, San Francisco's Board of Supervisors resolved that studies should be made to determine if a bridge could be built to span Golden Gate Strait. Engineer Joseph Strauss, the nation's foremost authority on bridge construction, was asked if such a bridge could be built. Strauss reported affirmatively, estimating a construction cost of $27 million.

There was discussion. There was debate. There were years of inaction. Finally, the president of the Santa Rosa Chamber of Commerce called a meeting of representatives of San Francisco and north bay counties to consider ways to move forward. The Redwood Empire Association also was a strong motivating force. Assembly-



man Frank Coombs of Napa then took the initiative, and introduced the Golden Gate Bridge and Highway District Act, adopted by the State Legislature on May 25, 1923.

The legislation called for the proposed bridge to be financed by tolls, backed by the taxing power of the District. The new District almost immediately found itself in the courts and was faced with a succession of law suits designed to stop the plans for a bridge. The strongest opposition was from ferryboat interests. But there were also lots of skeptics who said, "It can never be built."

Supporters of the bridge prevailed. On December 4, 1928, the District was incorporated, with San Francisco, Marin, Sonoma, Del Norte, most of Napa and part of Mendocino Counties joining together.

The Bridge Board was organized on January 23, 1929, and shortly afterwards made its only tax levy—yielding $465,000 to pay initial expenses. The next year a bond election was held and was successful despite die-hard opposition. Approval was received from the electorate to issue $35 million in general obligation bonds to finance the design and construction of the bridge. In effect, if the bridge couldn't pay its obligations with toll revenue, then the citizens of the District would be liable for taxation. As it turned out, the taxation was never necessary. Construction began on January 5, 1933, almost 15 years after the bridge was first proposed by the San Francisco Board of Supervisors.

In short, after years of inaction by existing State and Federal levels of government, the citizens of the District's six counties invested the funds and took the economic risks that made the Bridge a reality. The District created to build, operate, and maintain the Golden Gate Bridge has operated successfully and solvently ever since those first uncertain, pioneering days.

On May 28, 1937, the Golden Gate Bridge—financed and built during the darkest days of the depression without the aid of a government subsidy or loan, and built in the face of hard-fought opposition—was opened to traffic. The Golden Gate Bridge proved to be successful beyond the dreams of its most enthusiastic supporters. It soon became a vital artery of livelihood, recreation, commerce and communications between San Francisco and the Redwood Empire counties north of San Francisco Bay. It also became a world-famous landmark, and the "spine" of a whole transportation frame—the Golden Gate Corridor.

But the success of the Golden Gate Bridge—as in many ways the success of our state and our nation—had its price in problems, too.

Traffic has grown by an average of some one million vehicles a year, until by 1969, the Golden Gate Bridge was carrying almost as many vehicles each month as it originally carried in a whole year! Stated another way, every ten years the Golden Gate Bridge's traffic load has doubled.

Managing the Traffic

Unprecedented population growth, the surge of suburban residence coupled with urban employment, the increase in recreational travel, the burgeoning of the trucking industry in the regional economy—all these factors have combined to create increasing traffic pressures on the Golden Gate Bridge and Corridor.

That the traffic to date has been handled by the Bridge without undue inconvenience to commuters and other travelers is due to interim solutions provided by the District Directors and Management.

In 1963, the Directors instituted reversible lanes, adjustable to the direction of peak traffic flows.

In 1968 one-way toll collection was put into effect. Bus tolls were reduced to encourage low fares for commuting by bus.

As described in more detail in other parts of this report, the District conducted intensive studies and laid plans in the 1960s for further facilitating, through toll plaza modernization, the one-way toll concept and non-stop toll collection, and for strengthening the physical structure of the Bridge. At the same time, the District conducted its own studies and cooperated with other agencies in their studies for alternate modes of transportation.

Thus, while providing interim solutions and coping with day-to-day operations of the Bridge, the District was also providing the foundations of more significant short-term and long-range solutions. These measures were given real impetus under the authority explicitly stated in the 1969 act of the State Legislature.

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Interim Golden Gate Bus System

In recent years, the Golden Gate Bridge, Highway and Transportation District has been urged by various municipalities, civic groups, and individuals to operate a bus system in the Golden Gate Corridor.

Greyhound Lines West has been providing a commuter service along U. S. Highway 101, but its routing is confined to the main highway and it has not proved sufficiently convenient or attractive to win great numbers of commuters away from their automobiles. The Greyhound service has been unprofitable, and the size of losses has discouraged Greyhound from either improving the service or risking investment in an expanded system. This is typical of private systems across the nation.

Beginning in 1965, the Marin County Transit District (MCTD) studied the possibility of establishing a "home to work" kind of bus transit system between Novato and San Francisco. Independent studies to explore the subject were undertaken by the Bridge District early in 1969.

MCTD developed a plan with several key objectives: *The bus system should be capable of relieving present commuter traffic congestion and absorbing future traffic growth until a rapid transit system could be implemented* ☐ *Winning commuters from autos to buses should be achieved mainly by the bus system's own merits rather than through negative incentives like increased auto tolls* ☐ *Better scheduling, better routing, and better equipment were recommended* ☐ *The bus service should be available to an increasing portion of Marin County population throughout the day, and improve the mobility of citizens who do not have private means of transport* ☐ *The system should be capable of replacing the existing Greyhound service and of being implemented promptly* ☐ *The deficit of the operation should be minimal* ☐ *The physical appearance of the buses and their facilities should enhance the visual quality of the environment.*

When the Bridge District became involved in the studies, it added another important objective: *The buses should be equipped with the latest devices to reduce pollutants; each vehicle, when put in service, should meet the 1975 anti-pollution standards of the State of California.*

The MCTD's studies culminated in an "Optimum Bus System" plan presented to its Board of Directors on August 6, 1969, for implementation. MCTD Directors reviewed the plan with reference to the Bridge District's studies and recommendations, and concluded that the Bridge District should implement the plan. Since the Bridge District, on September 12, 1969, had established as an official goal that by 1980 at least 50 per cent of commute traffic would be carried by mass transit systems, the operation of the bus system would be consistent with Bridge District policy, as well as with the new act of the State Legislature.

An experienced transit manager and staff were employed. And in accepting the responsibility for the bus transit plan, the Bridge District expanded the service area to include Sonoma County.

A program for a modern, attractive bus system in the Golden Gate Corridor was at last going ahead.

Development of the bus system was devoted in 1970 to route planning, to visual design, and to completing the physical specifications for the new equipment. The District also began to operate three bus services within Marin County, plus commuter club bus service to San Francisco. Two of the services are feeder operations to ferryboat landings in Sausalito and Tiburon, and the third—subsidized by MCTD—is a local service operating in Central and Northern Marin.

The visual design for the buses was completed late in 1970,

while specifications for new bus equipment were ready for bid in March, 1971.

The Golden Gate Bus System, as planned for initial operations late in 1971, will provide an extensive express service from the neighborhoods of Sonoma and Marin communities to U. S. Highway 101 and on into San Francisco. The route will terminate in San Francisco's financial district and at the Civic Center.

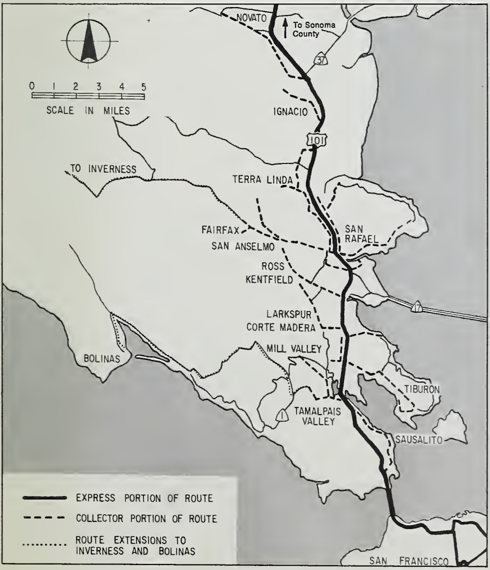
Between the hours of 7:00 and 9:00 a.m., some 150 buses will be serving the Golden Gate Corridor to San Francisco. These buses will start from the cities and communities of Marin and Sonoma Counties, pick up passengers on local streets en route to U. S. 101, and once on the freeway, run express to San Francisco. From 4:00 to 6:00 p.m., departures from San Francisco reverse the morning pattern.

During non-commute hours, service will be maintained until 1:30 a.m. each day, with normal headways of 20 minutes on the trunk line and 20 minutes on feeder routes. Trunk line and feeder buses will meet at transfer points, most of them at shopping centers to facilitate transferring. Weekend and holiday schedules will be similar to the weekday non-commute schedule, or as requirements dictate.

To achieve greater speed, the Bridge District is working closely with the California State Division of Highways to develop exclusive bus lanes on portions of U. S. 101. It appears promising that a program of reversing one or more freeway lanes in peak traffic hours can be worked out to create exclusive bus and car pool lanes.

When the Golden Gate Bus System goes into operation in December of 1971, Greyhound will discontinue its commute service. The Bridge District and Greyhound are collaborating to assure an efficient transition. Many of the present Greyhound personnel associated with the Marin commute service are expected to become employees of the Bridge District's Golden Gate Bus System.

Financing the capital costs of bus equipment and its supporting facilities will be accomplished with the Bridge District cash reserves set aside for this purpose. Government grants will be sought to reduce the District's dependence on its own reserves and income in order to implement fully the bus system. The Golden Gate Bus System will, however, require subsidy if it is going to keep fares at a level attractive enough to induce the maximum number of commuters to ride the system. Once the system is in full operation, the subsidy is expected to be about $1 million annually, an amount that will come from the Bridge's toll income. This subsidy includes funding of the depreciation reserve for the replacement of buses.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Fleet Ferry System

In discussions about bus and ferry systems, let's remember an important statistic: the average auto commuting in the Golden Gate Corridor carries 1.3 passengers. This means, roughly, that for every four passengers who commute by bus or ferryboat, three autos are removed from Bridge traffic. On each trip, one bus with 40 passengers has taken 30 cars from the Bridge; one ferryboat with 400 passengers has taken 300 cars out of Bridge traffic and out of the city streets and parking spaces of San Francisco.

This is just one of the compelling facts that have encouraged the study and development of a public ferryboat system serving between San Francisco and Marin Counties. Other factors are: the appealing Bay Area heritage of ferryboats, the attractiveness of water travel, the provision of an emergency link across the Golden Gate Strait, the present and impending growth of working population in San Francisco's lower Market Street-Embarcadero area, and the State's declared objective of encouraging and providing more opportune public access to San Francisco Bay, an objective embodied in the principles of the San Francisco Bay Conservation and Development Commission.

Also, as the Bridge District got deeper into its studies of long-range mass transportation facilities, it seemed important that the evolving system be a *balanced* public transportation system, with versatile, complementary modes of travel.

Over the years the Bridge District has been urged to inaugurate—or at least study—a ferry service. This urging has come from the Boards of Supervisors of San Francisco and Marin Counties and from a number of communities and civic organizations. Though encouraging studies had been made, the District's hands were tied. Passage of A. B. 584 in August, 1969, finally enabled the District to employ its funds to study and operate a ferry service.

In accord with the enabling legislation, the Directors of the Bridge District acted promptly. A commuter ferry, which had been operated by a private company between San Francisco and Tiburon since 1961, had been shut down for five months due to an employee strike. The District immediately contacted the operator and union involved, and arranged to run the ferry service under a charter arrangement until a strike settlement could be achieved.

The District quickly improved the former ferry schedule by adjusting arrival and departure times and by adding mid-day and weekend runs. One-way fares were reduced from 75¢ to 50¢. Under the District's management, the Tiburon ferry healthily increased its patronage. Upon settlement of the strike in April, 1970, the Tiburon service was restored to the private operator.

In the meantime, the District moved forward in response to the many official and unofficial requests to establish a full ferry operation between Marin County and San Francisco.

On January 12, 1970, Philip F. Spaulding & Associates, a prominent naval architectural and marine engineering firm, was employed to design a ferry passenger system and to make recommendations for the best kind of vessel design.

The Spaulding firm's corollary assignment, however, was to help the District respond to public demand to set up an initial ferry service between Sausalito and San Francisco. A ferryboat, faster than the type used in the Tiburon service, was purchased, and remodeling work to adapt the ship for service on San Francisco Bay was supervised by Spaulding.

Ferry service on the Bridge District's 15-knot *MV Golden Gate* began in August, 1970. In the first six months the vessel received an enthusiastic response from the public, carrying 351,000 passengers. Its success was abetted by the District's establishment of feeder bus service to the Sausalito terminal, a service later provided to the Tiburon landing. Also, a large parking area was obtained in northern Sausalito, where shuttle service is provided to and from the ferry landing. This makes it possible for passengers not using the feeder bus to make ferry connections without first having to find parking space in downtown Sausalito. The parking and shuttle service is free to ferry ticket purchasers.

The Spaulding firm submitted its report on August 12, 1970. The report recommended a Fleet Ferry System whose initial operations by 1972 would have five ferryboats out of Central Marin and two out of Sausalito, with service by 1977 from Northern Marin as well. Spaulding indicated, too, that a minimum start could feasibly be made with three vessels out of Central Marin, plus the Sausalito service. This reduced start was accepted by the District Board of Directors.

Central Marin's ships will be of 25-knot speed, 165 feet long, each with a capacity for 750 passengers. Sausalito will be served by the *MV Golden Gate* and a 25-knot vessel. When implemented later, the Northern Marin service will require even faster ships.

The Spaulding report also makes provision for operations between Tiburon and San Francisco, in the event the present private operation is ever terminated. A San Francisco civic group has suggested that the District lease boats from the private operator rather than design new ones. The problem, however, is that two of the private operator's boats at best do 12 knots, while the others are much slower. A Golden Gate Fleet Ferry System can only compete successfully with automobiles if it can rival auto traveling time as well as offer modern amenities.

Spaulding is now designing the new vessels, and the District expects to have specifications completed by May, 1971. According to the Spaulding estimates, when the system is operating with five ships, its commuter patronage should be 5,200 each way, each day. By 1977, as the fleet expands, Spaulding estimates that 9,000 commuters will use the service.

In addition to providing commuter service, the District plans to operate the ferries during the mid-day and on weekends as well.

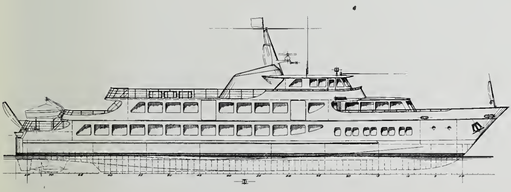
Traffic tie-ups on the Bridge are the most severe during summer weekends, and the success of the Sausalito ferry indicates that on weekends many people will take the ferry to Marin rather than drive an automobile. The Golden Gate Bus System will be integrated with the ferry system to provide access for ferry riders to points throughout Marin and to Sonoma County recreational areas.

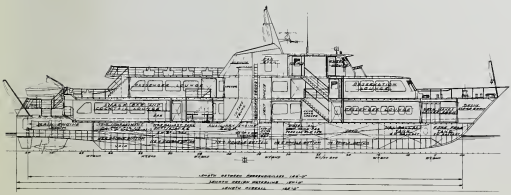
The ferries in mid-day and weekend service will also offer a "multi-port" service from San Francisco, stopping at Sausalito, Central Marin, and return, with stop-overs and transfer privileges to the succeeding ferryboats or to the Golden Gate Bus System. Fares are planned to be 50 cents each way on the direct runs and $1.50 for the "multi-port" ticket.

The cost of the system recommended by Spaulding to serve Southern and Central Marin, was estimated to be $17,145,000, including vessels, dredging and floats, and modest shoreside terminal development. Land acquisition costs in Central Marin will be additional.

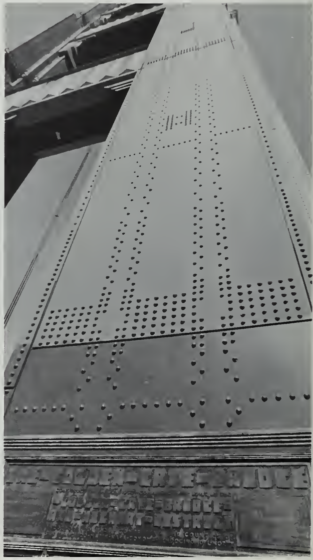
The first-phase ferry operations are projected by Spaulding to provide net income in excess of $250,000 annually. However, interest costs on the capital investment will require a subsidy from Bridge tolls in order to keep ticket prices at a level necessary to attract a high level of patronage. The estimated annual subsidy would be about $1.3 million.

Financing methods are being studied, with the likelihood that a non-profit corporation, under a joint powers agreement, will be formed to provide capital funding.





The Bridge System



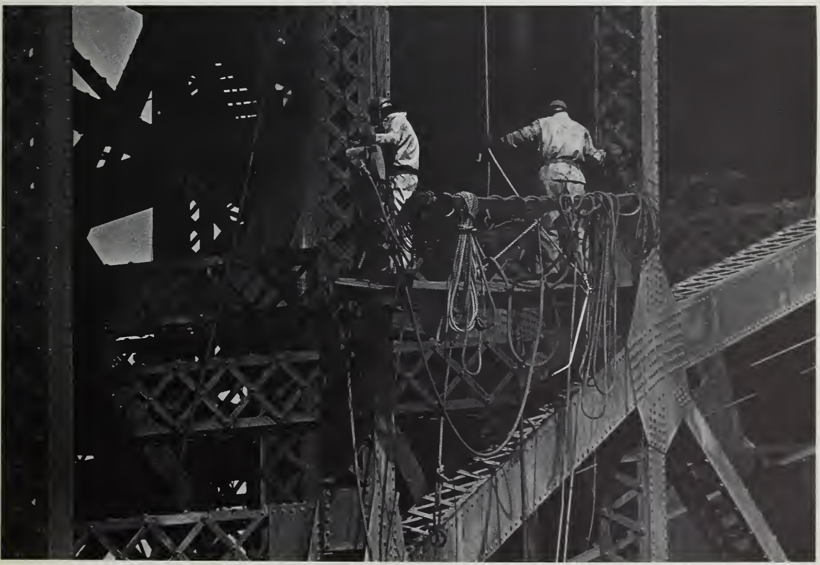
Reversible lanes. One-way tolls. Buses. Ferries. What about the Bridge itself — the indispensable coupling of the Golden Gate Corridor?

From the beginning, the Directors of the Golden Gate Bridge, Highway and Transportation District have considered their first responsibility to be the maintenance, replacements, and improvements necessary to keep the Golden Gate Bridge in prime condition.

Through the years, outside engineering consultants worked with the District's engineering and maintenance staff to check the physical structure and plan minor improvements and replacements.

For its first 14 years, despite several heavy windstorms which caused some movement of the deck at the storms' peaks, the Bridge weathered without incident the onslaughts of nature. Then, on December 1, 1951, a storm with wind gusts of up to 69 miles per hour hit the Bridge at a right angle and persisted throughout the day. Because of undulations of the roadway, Bridge traffic was stopped at 5:55 p.m. In succeeding hours, when the wind had decreased and the Bridge staff had made a rapid inspection of the span, the traffic lanes were reopened.

Even before the storm abated, Clifford Paine, who had been the project engineer during the construction of the Bridge, was called from Chicago to make a close inspection of the span. During the following days, he carefully examined the structure, and found



it sound. However, the storm had caused damage in various elements that needed replacement or repair. This work was immediately undertaken and completed early in 1952.

The damage the Bridge had suffered, and the fact that a suspension bridge (though an entirely different type) across the Tacoma Narrows in Washington had collapsed 12 years before during a storm, caused the Directors of the District to request Engineer Paine to advise of any structural changes or improvements needed to protect the Bridge from a storm-wrought calamity in the future.

Following an extensive engineering study and model testing, it was recommended in 1953 that the Bridge be strengthened by installation of a bottom lateral bracing system. The Directors approved the recommendation, and the work was completed in 1954. The cost was $3.5 million.

The effect of the improvements was to increase greatly the strength of the Bridge. An additional benefit was to create the structural framework for an unseen lower bridge deck.

In October, 1967, the District engaged the services of the leading engineering firm of Amman & Whitney to give the Bridge a minute examination of the span and its foundation. The engineering inspection extended over a two-year period, and the results are best summarized by this quotation from the consultants' report:

"Our investigation showed that parts of the bridge are in excellent condition, requiring no correction at this time, while other parts are in need of remedial work or replacement. Although some repairs and replacements should be instituted as soon as possible, there are now no defects so critical that immediate emergency steps must be taken. Where the more critical areas were uncovered, the District maintenance staff quickly altered their work schedule to make the necessary repairs.

"It is fortunate that the irreplaceable parts such as the cables, anchorages, towers and piers above water level are all in sound condition. We therefore conclude that with the recommended repairs and replacements completed and with continued good maintenance, the Golden Gate Bridge will be capable of serving the Bay Area well into the future."

There were a number of recommendations in the report for work to restore the Bridge and keep it in essentially new condition. Most of the work is minor in nature and can be accomplished in the course of routine maintenance. However, one major project was strongly proposed and has been approved by the Bridge Board. The engineers urged that the vertical suspender cables and their connections to the span deck should be replaced. The cost of the first stage of this work would be approximately $5 million. Work is expected to begin in late 1971.

The other remedial work, when approved and completed, will find the Golden Gate Bridge even more stalwart than when originally constructed, with a life span that will extend over the next two centuries.

While the structural integrity of the Bridge itself is secure, its traffic-carrying capacity is hampered by constriction at the toll gates. Both southbound (direction of toll collection) and northbound vehicles must pass through the toll gates. On July 1, 1969, the District retained PBQ & D, Inc., engineers, to develop a preliminary design and cost estimate for a southbound roadway bypassing the Bridge toll gates and for modernization of the toll plaza. These studies were to be based upon preliminary studies completed by the District staff. The engineers' plan recommends bypassing the toll plaza with a new roadway for southbound vehicles and changing the toll collection to northbound vehicles.

The engineering firm was also asked to study reversible roadway controls, toll registry and collection equipment, and the Bridge communications system.

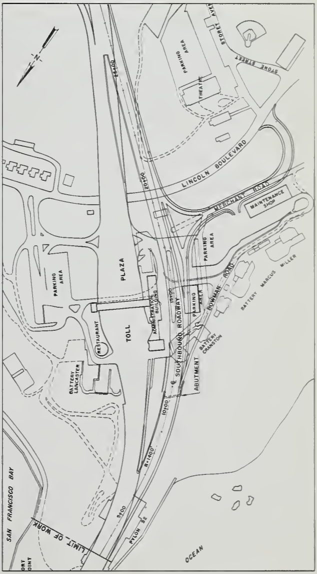
As submitted, the preliminary design for the bypass roadway calls for four southbound lanes to swing around the west side of the District Administration Building, rejoining the highway opposite the northbound Presidio on-ramp. The alignment is approximately 2,650 feet long and requires expansion of the viaduct from the south headland to the Bridge as well as construction of overpasses above the roads beneath the existing approach. It will be necessary, also, to relocate the Bridge maintenance facilities which lie in the path of the proposed bypass.

Cost of the bypass roadway has been estimated at $3,257,000. Of the total, approximately half is required to expand the approach viaduct. Detailed engineering plans for the first phase have been authorized and when completed, bids for the construction work will be asked.

Since completion of the Bridge in 1937, there have been many advances in toll collection methods and equipment which help to speed traffic and provide better controls. The District itself has been testing automatic vehicle identification devices which allow vehicles to pass through the toll gates without stopping. The vehicle is identified electronically, and a record is made for eventual billing. The system is now in service for recording passage of the District's own vehicles.

These are some of the major actions designed to protect the span and improve its capability to handle the heavy traffic loads being experienced now and expected to continue for the rest of its life.

The District has set aside reserves to pay for the repairs and improvements discussed above.



The Question of a Transit Deck

Studies of the feasibility of adding a transit deck to the Golden Gate Bridge date back a decade. In March of 1961 an engineering study for the Bay Area Rapid Transit District (BART) concluded it was practical to add two rapid transit tracks below the Bridge roadway. Clifford Paine, who had been principal engineer in designing and constructing the Bridge, reviewed the report for the Bridge District and recommended against having BART's proposed types of rapid transit trains operate over the Bridge.

In January, 1962, with the concurrence of BART, the District appointed O. H. Ammann, Frank M. Masters and N. M. Newmark as an Engineering Board to review the conflicting reports. The appointees had been nominated by the presidents of Massachusetts Institute of Technology and California Institute of Technology. The Engineering Board's report stated in part that "...the margin of safety would be decreased to a greater extent than is advisable (and) installation of (rail) rapid transit on the Golden Gate Bridge would lead to a decrease in the possible life of the bridge."

The rejection was based on the severity and vibrational impact of the loads created by BART-type trains and the way in which these loads are applied to a flexible, suspended structure.

In 1964 the District engaged the engineering firm of Ammann & Whitney to report on the feasibility of installing a lower deck for vehicular traffic. This study found that a lower deck for automobile traffic was feasible.

In 1965 the California State Department of Public Works began extensive studies of traffic problems and new crossbay links, and examined the question of adding a lower deck to the Golden Gate Bridge. The Department's final report, issued in May, 1967, stated that improvements of the existing Golden Gate Corridor, including as the first phase a transit deck on the Golden Gate Bridge, expanded highway approaches, and a bus rapid transit system, would provide adequate transportation services and was financially feasible.

In August, 1967, the District authorized Ammann & Whitney to proceed with the preliminary design of a lower deck. Their report, received in March of the following year, concluded that up to four vehicular traffic lanes could be safely constructed on a lower bridge deck with only moderate changes in the existing structure. They further concluded that one lane of H-13 load could be accommodated. Exterior appearance of the span would be virtually unchanged. The Bridge profile would be exactly the same.

Kaiser Engineers, in later studies, assumed that a two-lane, transit-only busway could be accommodated on a lower bridge deck safely according to the criteria recommended by Ammann & Whitney. At the insistence of the District, Kaiser included in its studies fixed guideway systems on a lower bridge deck, noting that rapid transit vehicle design and manufacturing technologies have reduced the ratio of vehicle weight per passenger since the first studies of a transit deck in 1962. Kaiser, therefore, assumed that trains of the future could be shorter and lighter than the originally proposed BART equipment.

The Bridge is capable of being used for a lower deck for transit vehicles. Within its present lower framing can be built a transit deck for buses or lighter-weight fixed guideway systems without undue stress on the span, and without changing the Bridge's appearance or shortening its life. The design would exclude the use of the deck for autos and confine the use to transit vehicles.

In sum, the Golden Gate Bridge is still the formidable link in a future mass transit system in the Golden Gate Corridor.

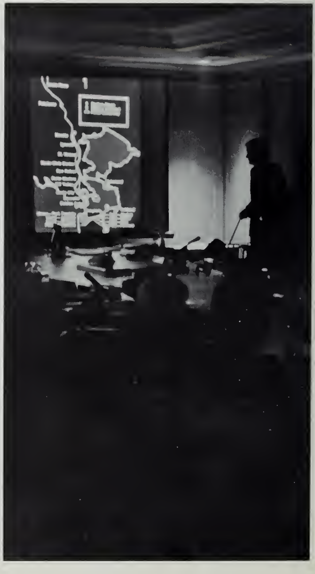
Transportation Facilities Study Program

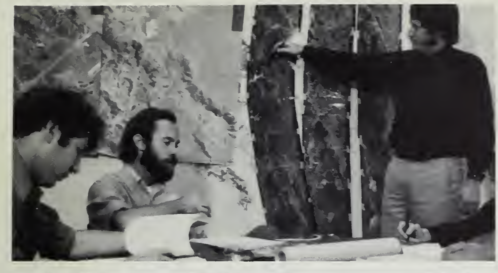
The programs, progress, and problems of the Bridge District in the 1960s were the context in which the District undertook studies to develop a long-range transportation facilities plan, as directed by the Legislature.

It was recognized by the Directors and Management that projects to alleviate Bridge traffic and provide intermediate systems of public transportation must have the flexibility to combine with and enhance a long-range rapid transit system.

To conduct the studies, the District retained two prime consultants: Kaiser Engineers, to study the engineering and economic aspects; and Okamoto/Liskamm, Inc. to analyse socio-environmental and urban planning factors. In order to relate the studies closely to the desires and needs of the communities concerned, two advisory groups were formed: the Technical Advisory Group, composed of representatives of municipal, county, regional, and state government agencies; and the Citizens Advisory Panel (CAP).

The Citizens Advisory Panel was unique. More than 100 organizations and individuals representing a broad range of interests, viewpoints, and geographic areas were invited to participate in the transportation studies through study discussion groups, each of which focused on a particular issue related to transit. In turn, the study groups chose representatives (usually the study group chairman) to serve on the Citizens Advisory Panel in its collaboration with the District staff, consultants, and Technical Advisory Group.





Together, the District's staff, consultants, and advisors worked for over a year shaping the study program, defining and redefining its goals and scope, carrying out the studies, and reviewing the results.

Drawing on many earlier studies, Kaiser and Okamoto/Liskamm initially examined some 25 preliminary concepts for mass transportation in the Golden Gate Corridor. At the same time, they developed a comprehensive group of criteria by which to evaluate the concepts. These criteria included 15 major engineering and financial standards and 19 major urban design and environmental guideposts. Each of the 25 original concepts was then evaluated, and those which scored low on the criteria scale were eliminated.

The professional consultants were, by contract, directed to develop two to three viable transit alternatives. Evaluations by the consultants, Citizens Advisory Panel and Technical Advisory Group reduced the number of preliminary concepts from 25 to three. Then, at the urging of the Citizens Advisory Panel and with the concurrence of the District's Directors, two additional concepts, variations of ones evaluated earlier, were included in the final evaluation. Also added was a "test concept"—that of applying short-term plans to a long-range period.

With this consensus on the scope of the studies, the five concepts were studied in the form of detailed "alternatives," while the "short-term plan" concept was examined for its effect on the study area and as a measurement of the long-range alternatives.

The consultants presented the results of their studies in November, 1970, and their published reports were subsequently submitted to the District early in 1971.

Transit System Criteria

Service
- *Number of users*
- *Capacity*
- *Speed and travel time*
- *Availability*
- *Reliability*
- *Convenience*
- *Comfort*
- *Safety*

Financial
- *Capital cost*
- *Operating costs*
- *Revenue*
- *Financing*

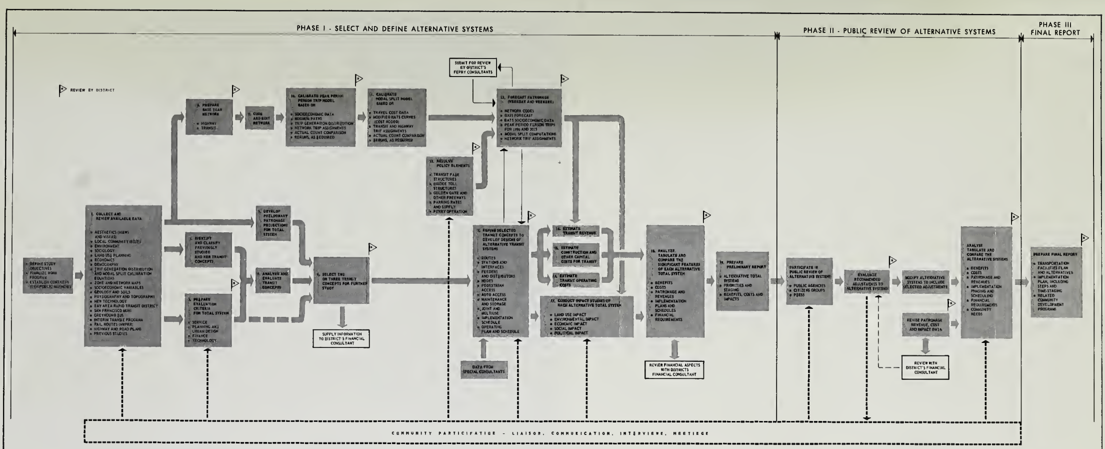
Urban Planning
- *Social*
- *Economic*
- *Environmental and ecological*
- *Urban planning*
- *Land use*

Technical
- *Flexibility*
- *Life span*
- *Expansibility*

Constraints
- *Public acceptance*
- *Political*

Transportation System Objectives

Conform with planning
Obtain public acceptance
Provide mobility
Balance system components
Provide reliability, convenience and comfort
Provide for future growth
Improve safety
Incorporate new technology
Minimize total costs

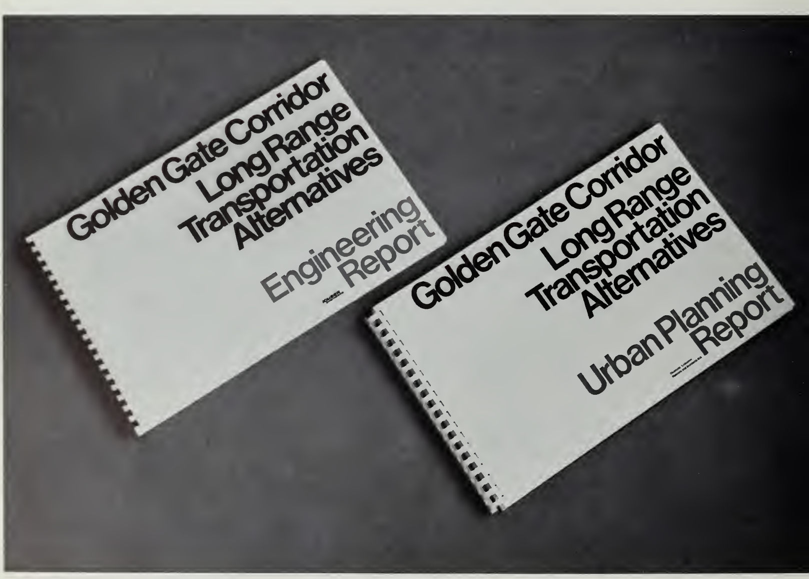

PHASE I - SELECT AND DEFINE ALTERNATIVE SYSTEMS
PHASE II - PUBLIC REVIEW OF ALTERNATIVE SYSTEMS
PHASE III FINAL REPORT
R REVIEW BY DISTRICT
• DEFINE STUDY OBJECTIVES
• FINALIZE WORK PROGRAM
• ESTABLISH CONTACTS WITH PUBLIC AGENCIES
1. COLLECT AND REVIEW AVAILABLE DATA
• AESTHETICS (VIEWS AND VISTAS)
• LOCAL COMMUNITY ISSUES
• ENVIRONMENT
• SOCIOLOGY
• LAND USE PLANNING
• ECONOMICS
• DEMOGRAPHY
• TRIP GENERATION DISTRIBUTION AND MODAL SPLIT CALIBRATION EQUATIONS
• ZONE AND NETWORK MAPS
• SOCIOECONOMIC VARIABLES
• GEOLOGY AND SOILS
• PHYSIOGRAPHY AND TOPOGRAPHY
• NEW TECHNOLOGY
• BAY AREA RAPID TRANSIT DISTRICT
• SAN FRANCISCO MUNI
• GREYHOUND BUS
• INTERIM TRANSIT PROGRAM
• RAIL ROUTES (NWPRR)
• HIGHWAY AND ROAD PLANS
• PREVIOUS STUDIES
8. PREPARE BASE YEAR NETWORK
• HIGHWAY
• TRANSIT
9. CODE AND EDIT NETWORK
10. CALIBRATE PEAK PERIOD PERSON TRIP MODEL BASED ON
• SOCIOECONOMIC DATA
• MINIMUM PATHS
• TRIP GENERATION DISTRIBUTION
• NETWORK TRIP ASSIGNMENTS
• ACTUAL COUNT COMPARISON
• RERUNS, AS REQUIRED
11. CALIBRATE MODAL SPLIT MODEL BASED ON
• TRAVEL COST DATA
• MODIFIED BATS CURVES (COST ADDED)
• TRANSIT AND HIGHWAY TRIP ASSIGNMENTS
• ACTUAL COUNT COMPARISON
• RERUNS, AS REQUIRED
2. IDENTIFY AND CLASSIFY PREVIOUSLY STUDIED AND NEW TRANSIT CONCEPTS
3. PREPARE EVALUATION CRITERIA FOR TOTAL SYSTEM
• SERVICE
• PLANNING AND URBAN DESIGN
• FINANCE
• TECHNOLOGY
5. DEVELOP PRELIMINARY PATRONAGE PROJECTIONS FOR TOTAL SYSTEM
4. ANALYZE AND EVALUATE TRANSIT CONCEPTS
6. SELECT TWO OR THREE TRANSIT CONCEPTS FOR FURTHER STUDY
SUPPLY INFORMATION TO DISTRICT'S FINANCIAL CONSULTANT
SUBMIT FOR REVIEW BY DISTRICT'S FERRY CONSULTANTS
13. FORECAST PATRONAGE (WEEKDAY AND WEEKEND)
• NETWORK CODES
• BASS FORECAST
• BATS SOCIOECONOMIC DATA
• PEAK PERIOD PERSON TRIPS FOR 1990 AND 2015
• MODAL SPLIT COMPUTATIONS
• NETWORK TRIP ASSIGNMENTS
12. RESOLVE POLICY ELEMENTS
• TRANSIT FARE STRUCTURES
• BRIDGE TOLL STRUCTURES
• GOLDEN GATE AND OTHER FREEWAYS
• PARKING RATES AND SUPPLY
• FERRY OPERATION
7. REFINE SELECTED TRANSIT CONCEPTS TO DEVELOP DESIGNS OF ALTERNATIVE TRANSIT SYSTEMS
• ROUTES
• STATIONS AND INTERFACES
• FEEDERS AND DISTRIBUTORS
• MODES
• PEDESTRIAN ACCESS
• AUTO ACCESS
• MAINTENANCE AND STORAGE
• JOINT AND MULTIUSE
• IMPLEMENTATION SCHEDULE
• OPERATING PLAN AND SCHEDULE
DATA FROM SPECIAL CONSULTANTS
16. ESTIMATE TRANSIT REVENUE
15. ESTIMATE CONSTRUCTION AND OTHER CAPITAL COSTS FOR TRANSIT
14. ESTIMATE TRANSIT OPERATING COSTS
17. CONDUCT IMPACT STUDIES OF EACH ALTERNATIVE TOTAL SYSTEM
• LAND USE IMPACT
• ENVIRONMENTAL IMPACT
• ECONOMIC IMPACT
• SOCIAL IMPACT
• POLITICAL IMPACT
18. ANALYZE, TABULATE AND COMPARE THE SIGNIFICANT FEATURES OF EACH ALTERNATIVE TOTAL SYSTEM
• BENEFITS
• COSTS
• PATRONAGE AND REVENUES
• IMPLEMENTATION PLANS AND SCHEDULES
• FINANCIAL REQUIREMENTS
REVIEW FINANCIAL ASPECTS WITH DISTRICTS FINANCIAL CONSULTANT
19. PREPARE PRELIMINARY REPORT
• ALTERNATIVE TOTAL SYSTEMS
• PRIORITIES AND STAGING
• BENEFITS, COSTS AND IMPACTS
PARTICIPATE IN PUBLIC REVIEW OF ALTERNATIVE SYSTEMS
• PUBLIC AGENCIES
• CITIZENS GROUPS
• PRESS
EVALUATE RECOMMENDED ADJUSTMENTS TO ALTERNATIVE SYSTEMS
MODIFY ALTERNATIVE SYSTEMS TO INCLUDE SELECTED ADJUSTMENTS
REVISE PATRONAGE REVENUE, COST AND IMPACT DATA
REVIEW WITH DISTRICT'S FINANCIAL CONSULTANT
ANALYSE TABULATE AND COMPARE THE ALTERNATIVE SYSTEMS
• BENEFITS
• COSTS
• PATRONAGE AND REVENUES
• IMPLEMENTATION PHASING AND SCHEDULING
• FINANCIAL REQUIREMENTS
• COMMUNITY NEEDS
PREPARE FINAL REPORT
• TRANSPORTATION FACILITIES PLAN AND ALTERNATIVES
• IMPLEMENTATION PLAN, INCLUDING STEPS AND TIME-STAGING
• RELATED COMMUNITY DEVELOPMENT PROGRAMS
COMMUNITY PARTICIPATION - LIAISON, COMMUNICATION, INTERVIEWS, MEETINGS

WORK FLOW DIAGRAM

GOLDEN GATE CORRIDOR TRANSPORTATION SYSTEMS STUDY

Study Program

The Five Alternatives



On the next two pages, the five alternatives are described and illustrated in their most basic form. The voluminous full reports of Kaiser Engineers and Okamoto/Liskamm, Inc. have been submitted to the Legislature as part of the master submissions prepared for each House.

It should be explained here that the consultants' reports dealt not just with the regional and area impacts of each alternative, but also analysed at great length the likely physical, economic, and socio-environmental effects on different sections and communities of the Golden Gate Corridor. During and following the studies, all these elements were carefully reconsidered by the Citizens Advisory Panel, by the District engineering and planning staff, and by the District's Board of Directors.

It should also be emphasized that the five alternatives were not meant to be the exact systems that might be built, but, rather, a group of examples to help the public identify a workable and acceptable goal, and to stimulate comments and criticism.

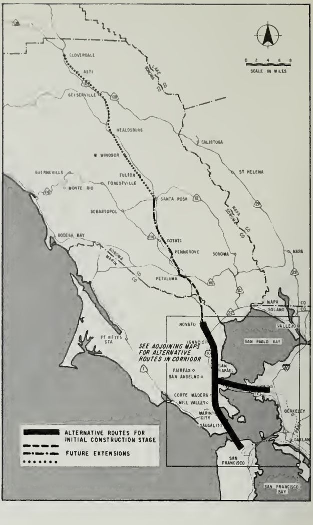
Here we wish merely to summarize the group of five alternatives which were the subject matter of subsequent public hearings and post-hearing review by the consultants, advisors, and the Bridge District.

All of the alternatives assumed a bus feeder system from community neighborhoods to the trunk line. In the case of fixed guideways (Alternatives 1, 2, and 4), passengers would have needed to transfer at the trunk line. In the case of exclusive busways (Alternative 3 and a segment of Alternative 5), the feeder buses could in most instances proceed onto the trunk line without the necessity of transfer by the passenger.

All systems had direct or feeder connections to Sonoma County and to the Richmond-San Francisco BART station.

The term "fixed guideway" covered a rapid transit system in which vehicles run on a fixed route but cannot operate off the route. The word "rail" was not used because trains could conceivably use conventional rail, air cushion, monorail, magnetic support, or other emerging technologies.

All trunk line systems assumed exclusive rights-of-way, and also assumed separation—above or below grade—from freeways and city streets. These alternatives assumed a lower bridge deck (for transit only), and two used an underwater tube across Golden Gate Strait.



LEGEND

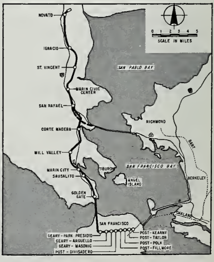
━━━ FIXED GUIDEWAY

━ ━ ━ EXCLUSIVE BUSWAY

━○━ STATION OR BUS STOP

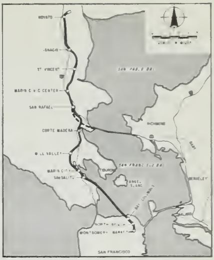
Alternative 1

Type of System: Fixed guideway transit on exclusive right-of-way, using Bridge transit deck. *Typical time and fare:* SF terminal to San Rafael (including connecting bus): 37 minutes, $1.20 one way (without discount for monthly or weekly commute). *Estimated Annual Cost:* $35.1 million in 1980, reducing progressively to $4.5 million by 2015. *Estimated Annual Cost per Passenger:* $313 in 1985, to $29 in 2015. *Benefit-Cost Ratio:* 1.05. *Weekday Daily Patronage:* 196,000 by 1985, 300,700 by 2015. *Peak Period Passengers:* 24,200 by 1985, 29,000 by 2015.



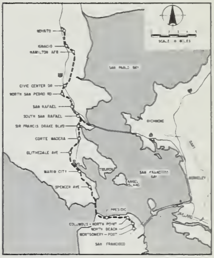
Alternative 2

Type of System: Fixed guideway transit on exclusive right-of-way, using transbay tube. *Typical time and fare:* SF terminal to San Rafael (including connecting bus): 27 minutes, $1.20 one way (without discount for monthly or weekly commute). *Estimated Annual Cost:* $35.9 million in 1980, reducing progressively to $4.6 million by 2015. *Estimated Annual Cost per Passenger:* $462 in 1985, to $38 by 2015. *Benefit-Cost Ratio:* 1.12. *Weekday Daily Patronage:* 135,800 by 1985, 229,400 by 2015. *Peak Period Passengers:* 23,400 by 1985, 35,400 by 2015.



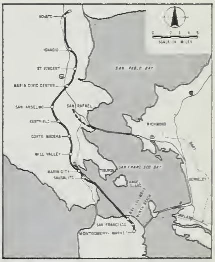
Alternative 3

Type of System: Bus rapid transit on exclusive right-of-way, using Bridge transit deck. *Typical time and fare:* SF terminal to San Rafael (including connecting bus): 29 minutes, $1.20 one way (without discount for monthly or weekly commute). *Estimated Annual Cost:* $17.5 million in 1980, reducing progressively to $1.1 million by 2015. *Estimated Annual Cost per Passenger:* $235 in 1985, to $10 in 2015. *Benefit-Cost Ratio:* 1.42. *Weekday Daily Patronage:* 130,200 by 1985, 208,900 by 2015. *Peak Period Passengers:* 17,400 by 1985, 27,800 by 2015.



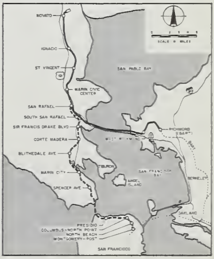
Alternative 4

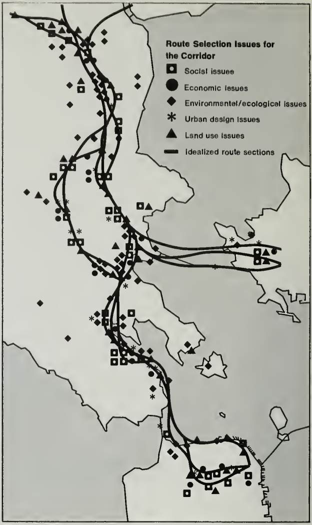
Type of System: Fixed guideway transit on exclusive right-of-way, using transbay tube. *Typical time and fare:* SF terminal to San Rafael (including connecting bus): 28 minutes, $1.20 one way (without discount for monthly or weekly commute). *Estimated Annual Cost:* $35.6 million in 1980, reducing progressively to $7.2 million by 2015. *Estimated Annual Cost per Passenger:* $511 in 1985, to $69 in 2015. *Benefit-Cost Ratio:* 0.86. *Weekday Daily Patronage:* 123,200 by 1985, 208,500 by 2015. *Peak Period Passengers:* 21,600 by 1985, 35,200 by 2015.



Alternative 5

Type of System: Exclusive busway from San Rafael to San Francisco, using Bridge transit deck; and rail line extension of BART from Richmond to San Rafael over second Richmond-San Rafael Bridge, then north to Novato. *Typical time and fare:* SF terminal via Golden Gate Bridge to San Rafael (including connecting bus): 29 minutes, $1.20 one way (without discount for monthly or weekly commute); Richmond to Novato, 34 minutes, 95¢ one way. *Estimated Annual Cost:* $36.4 million in 1980, decreasing progressively to $2.8 million by 2015. *Estimated Annual Cost per Passenger:* $531 in 1985, to $28 in 2015. *Benefit-Cost Ratio:* 0.72. *Weekday Daily Patronage:* 119,800 by 1985, 205,100 by 2015. *Peak Period Passengers:* 15,200 by 1985, 22,000 by 2015.





The environmental impacts of the five alternatives and the test alternative were examined in the Okamoto/Liskamm report. The charts shown here are graphic depictions of some of their evaluations. Each transit alternative—in sometimes subtle ways—would differently affect the region, the areas, the sections, and the individual communities of the Golden Gate Corridor. Four of the alternatives retained the business-commercial centrality of San Francisco. Another dispersed the basic business-commercial growth. Two alternatives provided new transit service to low-income sections; the others assumed municipal responsibility for providing intra-city transit. The routes, the station locations, the zoning, and all the other facets of each alternative could determine in the future how open space is used, whether growth is concentrated or dispersed, what sorts of disruption or dislocation are in store, and other such major community concerns. The Okamoto/Liskamm study report, like the Kaiser report, runs well over 100 double-size pages.

When the study criteria were applied to the "test concept"—using interim systems for long-range solutions—it was found that the District's plans for the Golden Gate Bus System and Fleet Ferry System would not be able to meet engineering and environmental criteria beyond 1980. The consultants did, however, regard these interim systems as creating significant short-term improvements that can likewise be compatible with, and complementary to, future rapid transit systems. After 1980, the interim systems could convert to the role of feeders and collectors. Standing by themselves after 1980, the interim systems would not be viable, and, according to estimates by the consultants and Citizens Advisory Panel, would cost the District economy and its citizens over $1 billion in lost time, stagnant property values, additional highway construction, compensating services, and the other curses of rampant urban sprawl.

After Kaiser and Okamoto/Liskamm presented the results of their studies and while their full reports were being printed, the District published a summary, and the material was disclosed and furnished to the public prior to and then during the public hearings.

The alternatives were now ready for public review.

Potential of Alternatives to Meet Regional Goals

Transportation Alternatives	1(a)	2(a)	2(b)	3(a)	4(b)	5(a)	6*
Reinforce City-Centered Concept of Regional Development	●	●	◐	●	◐	●	◐
Diminish Dependence on the Automobile	●	●	◐	●	◐	●	◐
Encourage Job Centers Outside San Francisco	◐	◐	◐	◐	◐	●	◐
Increase Minority Access to Jobs and Housing	●	●	◐	◐	◐	●	◐
Service Recreation Trips to Marin and Sonoma Counties	◐	◐	●	●	●	◐	●
Maintain Positive Existing Identities of Marin and San Francisco	●	●	◐	●	◐	●	◐

● *Higher Potential to Meet Goal*

◐ *Lower Potential to Meet Goal*

**No transit; assumes expanded highway network*

System Features and Operating Data

Transit Alternative	Length of Trunk Line (Miles)	Number of Stations	Travel Time and One Way Fare Between San Francisco CBD and Novato	San Francisco CBD and San Rafael	San Francisco CBD and Mill Valley	Richmond and Novato
1A	30	18	49 min. 140¢	37 min. 120¢	30 min. 100¢	38 min. 95¢
2A	27	12	39 min. 140¢	27 min. 120¢	20 min. 100¢	38 min. 95¢
2B	27	12	39 min. 140¢	27 min. 120¢	20 min. 100¢	38 min. 95¢
3A	28	16	43 min. 140¢	29 min. 120¢	23 min. 100¢	36 min. 95¢
4B	27	13	40 min. 140¢	26 min. 120¢	20 min. 100¢	45 min. 95¢
5A	41	16	45 min. 140¢	29 min. 120¢	23 min. 100¢	34 min. 95¢

Patronage

Transit Alternative	Peak Period Passengers at Maximum Load Point (One-Way) 1985	2015	Total Daily Patronage (Weekday) 1985	2015
1A	24,200	29,000	196,000	300,700
2A	23,400	35,400	135,800	229,400
2B	20,000	33,000	123,900	209,400
3A	17,400	27,800	130,200	208,900
4B	21,600	35,200	123,200	208,500
5A	15,200	22,000	119,800	205,100

Costs *(Millions of Dollars)*

Transit Alternative	Total Capital Requirement 1980	Annual Net Operating Surplus 1980	2015	Cumulative Net Operating Surplus to 2015	Annual Debt Service Charge 1980	2015
1A	987	0.6	4.8	72.5	35.7	9.3
2A	932	−2.1	5.4	21.4	33.8	10.0
2B	915	−1.7	3.1	0.1	33.1	10.2
3A	495	0.9	1.0	34.4	18.4	2.1
4B	944	−1.5	3.1	0.9	34.1	10.3
5A	944	−2.1	2.4	0.4	34.3	5.2

The "A" and "B" in the tables refer to differing highway networks.

Benefit-Cost Analysis

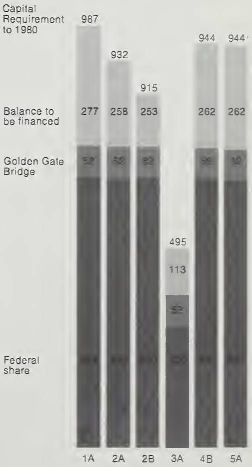
Transit Alternative	Total Benefit (Present Value) (Millions)	Total Capital Cost (Present Value) (Millions)	Benefit-Cost Ratio
1A	$754	$716	1.05
2A	763	679	1.12
2B	589	668	0.88
3A	528	372	1.42
4B	597	696	0.86
5A	497	692	0.72

Population and Employment Projections Used as a Basis for the Patronage Forecasts

County	Year	Population	Employed Residents
Nine Bay Area Counties	1965 1990 2015	4,396,000 7,496,000 9,957,000	1,673,000 3,081,000 4,061,000
Marin	1965 1990 2015	182,000 404,000 586,000	68,000 175,000 254,000
Napa	1965 1990 2015	62,000 140,000 181,000	24,000 64,000 84,000
San Francisco	1965 1990 2015	755,000 827,000 982,000	333,000 394,000 475,000
Sonoma	1965 1990 2015	171,000 368,000 722,000	55,000 132,000 257,000

Source: Bay Area Transportation Study and Bay Area Simulation Study.

Funding Requirements *(Millions of Dollars)*



The Public Hearings

A. B. 584 says, in part, "In developing the transportation facilities plan, the District shall hold public hearings so that interested persons and organizations are provided an opportunity to express their viewpoints."

The District strongly agreed, and followed this direction fully and faithfully, scheduling and arranging 21 public hearings in the District's six counties in a concentrated 60-day period from December 3, 1970, to February 3, 1971.

Hearing schedules, with study summaries, were sent in advance to over 300 civic organizations, government agencies, individuals, and news media. Each meeting was publicized and advertised in advance through area and community newspapers, radio stations, and television outlets. And each meeting also received news coverage of its actual proceedings. Meeting posters were distributed to public libraries, civic organizations, and municipal offices. Thirty-five thousand schedule cards were handed out to motorists passing through the Bridge toll gates.

The 21 public hearings attracted better than 1,200 participants, for an average of about 60 per meeting. Considering the rather dry nature of the topic at hand, and a succession of nasty weather during December, the average attendance was considered good. The participation was attentive, lively, thoughtful, and productive.

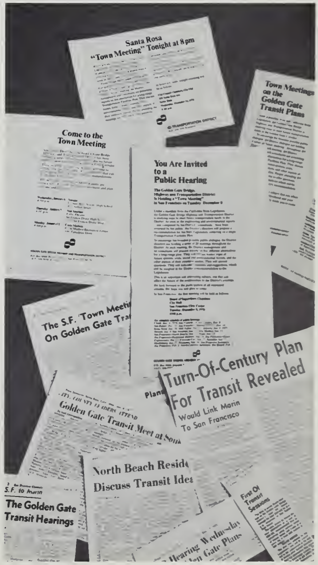
The meetings were held in the following order in the following cities: Ukiah, San Francisco (Civic Center), San Rafael, San Francisco (Marina District), Santa Rosa, Sonoma, Novato, San Anselmo, Corte Madera, San Francisco (North Beach), Napa, San Francisco (Richmond District), San Francisco (Geary Expressway District), Crescent City, Sausalito, Healdsburg, Petaluma, and Mill Valley. An additional Santa Rosa meeting was held at the invitation of the City Council. Finally, sum-up hearings were held in San Francisco and in San Rafael.

The hearings were conducted along the line of town meetings. The District's consultants and staff, using graphic displays, would outline the five-alternative systems, generally following the material in the printed study summaries which had been given to the audience. Following the informal presentation, the meetings were opened to questions and comments, and public dialogue was encouraged.

The District Board of Directors was well represented at every meeting, with the meeting chairmanship rotating among them.

Transcripts of the public dialogue of each meeting were made, with something like 2,500 pages of comments recorded. These transcripts are all being furnished as accompaniments to the District's master submissions to the State Legislature.

The extent to which the public was welcome to participate in the planning process—through the Citizens Advisory Panel and by way of the public hearings—was a frequent subject of favorable mention by citizens attending the hearings.



Santa Rosa "Town Meeting" Tonight at 8 pm

Town Meetings on the Golden Gate Transit Plans

Come to the Town Meeting

You Are Invited to a Public Hearing

The S.F. 'Town Meeti
On Golden Gate Tra

Turn-Of-Century Plan For Transit Revealed

Would Link Marin To San Francisco

Golden Gate Transit Meet at Son

North Beach Resid
Discuss Transit Ide

S.F. to Marin

The Golden Gate Transit Hearings

First Of Transit Sessions

Hearing Wednesday
Gate Plans

The meetings engendered position papers from several organizations, most of which took the trouble to study with care the District's summary of the consultants' reports and to have representatives at more than one meeting. At other times, many of the participants contacted the District staff to obtain clarifications and ask questions.

As the meetings progressed, précis of the audience's comments were prepared for the Directors, staff, and consultants so that they could review public comments in advance of the preparation of transcripts. When the transcripts were ready, they, too, were reviewed.

Following the conclusion of the hearings, the consultants and Citizens Advisory Panel prepared and submitted to the District their critiques and choices of the transportation alternatives, in the light of the discussions held and positions expressed at the public hearings.

There is no doubt that the "participatory" approach to planning taken by the District increased the amount of time necessary to complete studies and arrive at recommendations. Yet the process was healthy for the opportunity it provided the District's constituents to be its advisors and critics. And the process was worthwhile for the many valid concerns, important issues, and valuable insights which participants expressed and contributed.

These contributions became very much a part of the review made and the conclusions reached by the District's Directors, Management, project staff, consultants, and Citizens Advisory Panel as they formed their final recommendation.

Typical Comments on Hearings

"Earlier this week, the bridge district held its 22nd and final public hearing on these preliminary concepts and alternatives. This long, long series of widely publicized hearings has taken place at various strategic places throughout the six-county district. . . . Reactions varied widely, but there was one common point. There was almost unanimous approval of the way in which the studies were conducted and the way in which the hearings have been presented to the public."

San Rafael Independent Journal
February 6, 1971

"You have done a unique job in involving citizens. You have done one of the best jobs we have ever seen. These public hearings are another good example . . ."

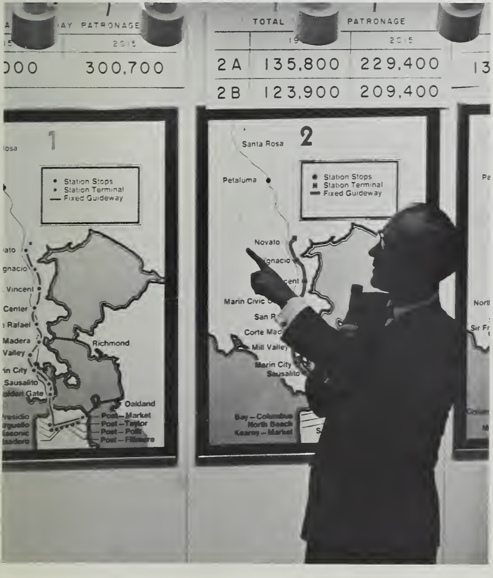
Michael Fischer
San Francisco Planning and
Urban Renewal Association
Transportation Committee

"The members of the Central Marin League wish to commend your Board for its efforts to involve the community in these discussions. We agree that the citizen should be involved in the decision-making process and we're glad that you've provided an opportunity for our participation."

Mrs. Carol Staley
League of Women Voters of
Central Marin

"We wish to commend the District for its efforts to involve the citizenry more actively in its deliberations. This was done by the establishment of the Citizens Advisory Panel who worked directly with the consultants during the course of the study, and by the holding of public hearings . . . It may be more time-consuming and occasionally abrasive, but it is the best way for the Bridge District to fully appreciate the wishes of the public, and respond most effectively to them."

Conservation Committee
San Francisco Bay Chapter
Sierra Club


TOTAL
PATRONAGE
2015
300,700
2A 135,800 229,400
2B 123,900 209,400
1
2
Santa Rosa
Petaluma
Station Stops
Station Terminal
Fixed Guideway
Novato
Richmond
Oakland
Post—Market
Post—Taylor
Post—Polk
Post—Fillmore
Marin City
Sausalito
Mill Valley
Bay—Columbus
North Beach
Kearny—Market

1.42

The District's Recommendation

Highlights of the District's Recommendation

We wish here to summarize the highlights of the Bridge District's recommendations. These highlights are discussed at greater length in the succeeding pages.

1. In consideration of community environmental values, a changing transportation technology, and financial realities, it is the aim of the District to avoid a fixed, unalterable plan. Rather, we recommend a continuous, flexible program of planning and implementation that will provide the Legislature, the District Directors, and the District Management with the opportunity to review, modify, and control the development, impact, and cost of a mass public transportation system sensitive to the public demand for transit service.

2. While recommending interim systems and phased growth, the program permits the deferment of a decision on the ultimate mode of transit to a later time, when more information becomes available on new technology. Yet staged preparation and implementation for rapid transit should start at an early date. The plan therefore recommends certain priorities which will dramatically improve interim transit systems and "position" the District for future decisions and options. The principle that is a keystone of our District's flexible program of implementation: Permanent right-of-way structures must be adaptable to either busway or fixed guideway systems.

3. While developing its longer-range solutions, the District should proceed with its interim systems of bus and ferry transit and its improvements of the Bridge and toll plaza.

The District has the reserves, revenues, and financial capability to cope successfully with the costs of the interim systems now being implemented.

4. The priorities for getting started on longer-range implementation are: ☐ Expedite the selection of rapid transit subway routing in San Francisco, with further study and close cooperation with the City of San Francisco ☐ Research and development of vehicles for best interim system and best ultimate mode for transit ☐ Reversed bus-lane concept for Waldo Grade area of Marin County to provide for express busing, also utilizing a transit-only deck on the Golden Gate Bridge, without altering Bridge appearance ☐ Further delineation of other Marin County routings and rights-of-way through collaboration with county and municipal governments of Marin, with acquisition of rights-of-way as they are agreed upon and become available.

This is a 10-year work program, estimated in its main elements to cost $301.5 million. Adding the programs for interim bus and ferry systems already in progress, the total estimate is $331.5 million.

5. The full 10-year program of research, planning, design, and implementation—and the evolving program for ten years beginning in 1980—will require Federal grants and other funding methods. In this respect, the District's need is common to most other areas of the country. Yet there is reason to hope that a revived national economy and a revised assessment of national priorities will engender greater Federal and State assistance for public transportation.

6. The District should continue as the sub-regional agency responsible for coordinated study, development and management of a multi-modal, balanced transportation system in the Golden Gate Corridor. It is the only sub-regional transportation agency in the Bay Area today that is developing and operating multi-modal public transportation services and at the same time has a measure of control over the automobile.

Recommendation

The Board of Directors of the Golden Gate Bridge, Highway and Transportation District agreed upon its recommendation in March, 1971.

The project staff, its consultants, and the Citizens Advisory Panel shared the public concern about "rigid" plans and felt strongly their own conviction that the future planning and implementation must have a reasoable degree of flexibility. The Board concurred with the premise that planning is a continuous process, and that the intrinsic issues were and are community environmental values in the face of growth, financial feasibility, governmental organization, and a changing transportation technology.

Americans live in an age where too often the grand, sweeping plan has been easier to come by than its execution, and where the day-to-day, step-by-step plan is too frequently looked upon as unworkable because it is unglamorous.

In our recommendation for a transportation facilities plan, the District Directors hold for bold principles. But we also hold for careful implementation.

Whatever transportation is developed must serve *people,* serve them comfortably, conveniently, and at a moderate cost. Only in this way can it hope to compete successfully with the automobile.

The automobile is not "the enemy." The automobile is too important and useful in our society. "The enemy" is lack of options, lack of choice, lack of the diversity we encourage and esteem in most American activities but have neglected or disregarded in the field of transportation.

Here in the Golden Gate Corridor is an opportunity to rectify that neglect, to achieve a pleasing balance of transportation that can be effective without being overpowering, efficient without being dehumanizing.

In our view, efficiency means that public transit must be able to transport people as quickly as, and more safely than, their automobiles can. Effectiveness—in relieving the traffic pressures that push with increasing relentlessness on the Golden Gate Bridge and its adjacent communities—means that at least 50% of daily commuter traffic should be carried across the Golden Gate Strait in public transit by the year 1980.

At the risk of being repetitive, let us mention again that the physical characteristics, projected patronages, financial requirements, and environmental impacts of all five alternatives studied by the District's consultants were evaluated by these consultants, reviewed with advisory groups, discussed in public hearings, and then examined again by consultants, staff, and Directors. Also evaluated, but discarded for its costliness in social and economic values, was a sixth alternative—that of adding no rapid transit to the intermediate bus and ferry systems already being implemented.

In the recommendation which the District's Board of Directors presents to the Legislature for its consideration, we have attempted to fuse the study consensus with the expressions of opinion by various organizations and individual citizens and with the stated policies of the county and municipal governments within the District's boundaries. Moreover, we have been conscious of state and national policies toward pollution, conservation, and the economy.

It became our aim—an aim reinforced by stated government policies and the many expressions of opinion by technical as well as citizen participants in our planning—to avoid a fixed, unalterable plan.

We have looked to the year 2015. But we have stared at the year 1980. Our recommended plan sets what our staff has called "a frame of reference" for the District's transit improvements in the next decade, leading toward system transitions to the year 2015.

It is really a blueprint of the continuous planning process and as such will provide the Legislature, the District Directors, and the District Management with the best opportunity to review, modify, and control the development, impact, and cost of a mass public transportation system.

Central to our plan is the phased development of a rapid transit system. It takes as its starting point the Golden Gate Bus System ("Optimum Bus System") which is being implemented now.

The District proposes that it continue to implement the interim bus and ferry systems as described at length in earlier sections of this report.

We are then recommending that the bus system, through a series of phased improvements, grow in stages into a rapid transit system operating on its own rights-of-way. And the route alignments and way structures would be designed so that a fixed guideway system could evolve when and if such a transition proves desirable.

This kind of phased growth of the Golden Gate Bus System into a rapid transit system will have many advantages: Transit capacity can be increased to match growing demands. Transit modes can be altered to accommodate technological advances. Environmental factors can be closely watched. And the capital outlay can be programmed to suit the availability of funds.

Our recommended plan, though inherently flexible, nevertheless does emphasize certain definite priorities that should be implemented without delay. These initial steps will forestall worse congestion in San Francisco and on the Bridge, and will "position" the District for the future decisions and options important to a successful, responsive transportation system for the people of the Golden Gate Corridor and their neighbors.

The District staff report stated it succinctly:

"In short, we are recommending a plan that is not a 'monolith,' yet a plan that can be continuously realistic and sensitive as to public needs and desires, available funds, and the state of transportation technology."

Let's now look at the plan step by step.

Interim Bus and Ferry Program

The District Directors recommend that the District's interim Golden Gate Bus System and Fleet Ferry System, along with its programs for improving Bridge traffic management, continue to be implemented. These systems are described in previous chapters of this report.

Rights-of-Way Development

Adaptability to All Forms of Predicted Future Rapid Transit: Increasing traffic demands in the Corridor, even by an optimistic estimate, will in a few years surpass the combined capacities of the Golden Gate Bus System, Ferry System, and the highway system. The provision of totally grade-separated rights-of-way, exclusively reserved for transit use, will thus be urgently needed in order to increase transit capacity and performance, at least in the most critically congested areas of the Corridor.

In order to give maximum flexibility for the future development of rapid transit, we recommend that right-of-way alignments and constructions of a permanent nature be adaptable to all forms of rapid transit applicable to the Corridor. The District intends to conduct the technological forecasting and the other research work needed to determine the design for adaptable right-of-way.

Even though the enforcement of higher design criteria may add some extra cost to the District, the resulting retention of options as to the ultimate mode of rapid transit is an advantage offsetting such costs.

The plan permits the deferment of a decision on the ultimate mode of rapid transit to a later time, when more information becomes available on new technology.

Other steps in our recommended plan are, then, meant to facilitate the staged implementation of a rapid transit system at an early date, starting in the most critical areas of the Corridor.

Priorities in Implementation

1. First Priority—San Francisco Section: San Francisco has repeatedly expressed its concern over traffic congestion on the city streets. Its Board of Supervisors has issued several resolutions urging early provision of a rapid transit system to serve the Golden Gate Corridor. From the viewpoint of public concern, construction of the District's rapid transit facilities in San Francisco should have a very high priority in terms of the allocation of resources and the firmness of scheduling.

From the operational viewpoint, downtown San Francisco is the single most critical constraint for continued growth of the interim Golden Gate Bus System ("Optimum Bus System"). Because of the limited space available for street loading and unloading in the financial district, the Golden Gate Bus System would, by the mid-'70s, face a serious problem meeting the growing demands.

It is therefore most desirable that the underground rapid transit right-of-way structures in San Francisco be started early enough to be completed around 1976. Construction of the remaining sections of the District's rapid transit facilities in San Francisco could follow the completion of the downtown section.

To complete the San Francisco rapid transit subway construction by the end of 1976, the final selection of the route and station locations should be made by early 1973.

There were diverse opinions expressed at public hearings concerning the possible routes and station locations in San Francisco. Many of these opinions (for instance, some advocating Geary Corridor while others favored shorter routes) had merit and validity. The Directors recommend that the District staff immediately initiate an in-depth discussion with the staffs of San Francisco city departments, and also undertake a preliminary engineering study, in order to expedite the final selection. Public hearings should also be held at the appropriate time as a means of further incorporating citizens' viewpoints.

The estimated project period of this first priority is from 1971 to 1976. The estimated cost of planning, designing, and constructing underground facilities in San Francisco is $204 million, but could vary substantially depending on the routing.

2. *Second Priority—Initial Development of Vehicles:* A research and development program, funded jointly by the District, Federal Government, and private industry, will be needed to obtain the best interim and ultimate transit vehicles and systems, both bus and fixed guideway.

Buses should have little or no harmful exhaust fumes while operating underground. The transportation industry is already engaged in research to develop turbo-electric propulsion systems. If fixed guideway is selected as the ultimate mode, the fixed guideway vehicles should be light enough to be sustained by the Bridge transit deck; here again, industry research holds promise of several types of lightweight fixed guideway vehicles.

The flexibility in the District's program for 1971-1976 stems not just from the adaptability of the right-of-way, but also the ability of interim-phase buses to provide intermediate mass transit and to be used later as connectors and feeders for fixed guideway, should this be the ultimate mode selected.

There must, of course, be more advanced research on both buses and fixed guideway vehicles, and the District proposes to conduct this research jointly with government and private industry, during the period from 1971 to 1976 as a start, and then continuing as necessary thereafter. The initial research must be done on buses in order to implement the interim system, and then there must be further study to compare bus and train potentials and feasibilities.

Earlier we spoke of "bold principles and careful implementation." The public must have comfortable, safe, quick mass transit as a transportation option, and a start toward providing it must be made. However, the District is not going to commit irrevocably to its intermediate system. Its research and development will continue to be as all-encompassing as possible, even though its present budgets of $5 million for research and $25 million for procurement of vehicles will in large part have to be concentrated on the initial system if there is to be one by the mid-'70s.

3. Third Priority—Waldo Grade Reversed Lanes and Bridge Transit Deck: An area almost as critical as the San Francisco Section is the Waldo Grade. And here our general goal of keeping our options open runs into a problem, though it is surmountable:

If we are going to decide the ultimate mode of rapid transit for the Corridor at a later date, construction of any permanent right-of-way between the north end of the Golden Gate Bridge and Marin City should be deferred. A workable busway through this section would not be adaptable to a fixed guideway system. On the other hand, a permanent right-of-way adaptable to fixed guideway is unnecessarily expensive for bus rapid transit alone.

A special busway on Waldo Grade can be most economically provided on a temporary basis by application of the "reversed bus lane" concept. Under this concept, freeway lanes in the opposite direction of peak traffic will be reserved during commute hours exclusively for buses. In this manner, the reversed bus lane could substitute for a permanent exclusive busway temporarily during certain times of the day and until vehicular traffic in the "off-peak direction" grows to a point of congestion.

For safe operation, the special busway on the Waldo Grade—especially southbound, in the morning, where the four regular lanes plus the busway would meet four 10-foot lanes at the present north bridgehead—must join with additional, exclusive lanes on the Bridge.

The construction of a two-lane transit deck on the Bridge is a necessary condition to implementing the reversed bus lane system on the Waldo Grade. Access to this transit deck would be limited by ramp design to transit vehicles only, and a lower transit deck will not alter the familiar profile of the Bridge. Here we refer you back to our discussion, *The Question of a Transit Deck,* on pages 26 and 27.

The six-mile section of exclusive busway between the Presidio and Marin City is planned to be in service more than a year before the opening of the San Francisco underground busway, providing a valuable testing ground for the bus rapid transit operation.

The reversed-lane implementation and the construction of a Bridge transit deck within the existing framework would extend from 1971 to 1975, and would cost approximately $67.1 million.

4. Fourth Priority—Other Marin County Sections: General consensus on the desirable route of rapid transit in Marin County is along the existing Northwestern Pacific Railroad (NWP RR) rights-of-way from Marin City to Novato. An exception is the Mill Valley section in which the imposition of the rapid transit route onto the NWP right-of-way would disrupt the planned land use of the area.

It is recommended that further delineation of the rapid transit route, in particular concerning the Mill Valley section, be achieved through collaborative efforts of the District with the County of Marin and its involved municipalities.

It is also recommended that any portion of the right-of-way in danger of being pre-empted should be obtained as it becomes available.

Ideally, construction of the rapid transit way should start from those areas where congestion of the freeway is severe and where construction of the way structure (including temporary access ramps to the freeway) is relatively easy. The Corte Madera section (between Paradise Drive and Sir Francis Drake Blvd.) is a case in point. The San Rafael section (between Bellam Blvd. and County Civic Center) also deserves attention, not only because it is a likely congestion area, but also because the current freeway program there entails relocation of NWP right-of-way which the planned rapid transit system would partially utilize.

Though having a lower priority than other phases of the work program, these projects may, depending upon further policy decisions, be completed before higher priority projects.

The total cost of first-phase acquisition of right-of-way in Marin was estimated (at 1970 figures) by Kaiser Engineers to be approximately $1,000,000.

Transit Improvement Guideline

			Approx. Proj. Cost Millions	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
RAPID TRANSIT	*San Francisco Right-of-Way & Stations Development*		204.4	*Prelim. Eng'ing. & Route Selection*		*Design*		*Construct*			*Operation*		
	Waldo and Bridge	*Waldo Reversal*	0.6		*Prelim. Eng'ing.*		*Design*	*Construct*			*Operation*		
		Transit Deck	66.5			*Design*		*Construct*					
	Marin Right-of-Way & Stations Development					*(Right-of-Way Acquisition, as Required)*							
	Vehicle Development		30.0		*Research & Development*				*Production*		*Operation*	*Additional Vehicle Production*	
Golden Gate Bus System			10.0	*Implementation*		*Operation*		*(Partial Conversion to Rapid Transit Starts)*					
Fleet Ferry System			20.0	*Design Terminals & Vessels*	*Construct Terminals & Vessels*						*Operation*		
Total Costs			331.5	10.2	22.5	32.0	88.0	117.8	54.0			7.0	
				◀ *Interim Ferry* ◀ *Feeder Bus*	◀ *G. G. Bus*	◀ *Ferry Operation*		◀ *Rapid Transit (Initial 6 Mi., 21%)*		◀ *Rapid Transit (11 Mi.) With New Vehicle All Underground in S.F.(39%)*			

Financing The Transit Program

When we total the steps of our recommendation for the program up through fiscal year 1979-80, we get a figure of $301.5 million in estimated costs, without right-of-way acquisition north of San Francisco. Adding our projections of capital investment for transit programs already under way, we arrive at $331.5 million.

When we also factor in subsidies for interim transit systems, ($18.6 million) and plans for new improvements and repairs for the Bridge, ($17.9 million), our total requirements come to $368 million.

Then we must allow in the same ten-year period for the normal estimated costs of on-going Bridge maintenance and operations — $58.7 million, bringing the tally of estimated disbursements to a grand total of $426.7 million through fiscal year 1979-80.

Along with the Future Sources of Funds shown in the tables, we must also add the Bridge District's reserves on hand as projected at the close of the current fiscal year. These are estimated to be $22.8 million. Part of these reserves is set aside for Bridge repairs and improvements in accordance with the provisions of A. B. 584 and Streets and Highway Code; and part is available for transit. In addition to available reserves, Bridge tolls exceed Bridge maintenance and operating expenses, and at present toll levels are expected to generate a surplus of $26.9 million through 1979-80.

All estimates reflect an escalation factor based on historical patterns of inflation.

Scheduling the projected disbursements with the monies estimated to be readily available, we find that while the District can finance its interim systems, make necessary Bridge improvements and repairs, and efficiently maintain and operate the Bridge, it must look to other sources in order to implement its longer-range program.

If we can assume — under the Urban Mass Transportation Act — two-thirds Federal assistance, the District would be able to obtain $220.7 million in additional funds. Participation by the State Division of Highways in the costs of reverse-lane modifications on the Waldo Grade approaches and contribution by Marin County for intra-county benefits would together provide another $1.5 million.

As the tables indicate, the District would then still need approximately $100 million to carry out its program. Let's therefore look at the possibilities for other funds. The sources are not listed in any order of preference, nor does the list assess the political acceptability of obtaining funds from these sources:

☐ The District's revenues from Bridge tolls could, after approval of voters within the District, support issuance of revenue bonds in a ratio of roughly 12 times the net available revenue produced by the tolls. There is also the possibility of an increase in Bridge tolls. In 1969, commute tolls were increased, with the increased revenues designated for transit.

The District's Financial Projections

Relation of Disbursements to Projected Revenues(1) *(Millions of Dollars)*

	1971-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	Total
Projected Disbursements	31.4	29.8	80.0	120.5	88.8	36.2	12.3	13.7	14.0	426.7
Projected Future Sources of Funds	23.5	20.6	55.1	81.1	63.1	28.0	10.3	12.9	13.2	307.8
From Bridge(2) Reserves	4.0	4.4	14.4							22.8
Additional Funds Required	0.0	0.0	19.2	39.4	25.7	8.2	2.0	0.8	0.8	96.1

Total Additional Funds Required—96.1 million through 1980.

(1)Revenue and disbursement figures assume that bus transit systems in full operation will be "break-even" operations. Reference: "Optimum Bus System," Marin County Transit District, August 1969; "Golden Gate Corridor Long Range Transportation Alternatives, Engineering Report," Kaiser Engineers, December 1970.

(2)Bridge reserve at end of 70-71 fiscal year, $22.8 million.

Projected Future Sources of Funds *(Millions of Dollars)*

	1971-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	Total
Bridge Tolls	9.0	8.6	8.8	9.2	9.4	9.7	10.0	10.3	10.6	85.6
Federal Grants(1)	14.2	11.8	46.2	72.5	53.4	18.0	0.0	2.3	2.3	220.7
Division of Highways(2)	0.2	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.6
Marin Transit District	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
TOTAL	23.5	20.6	55.1	81.1	63.1	28.0	10.3	12.9	13.2	307.8

(1)Assumes two-thirds funding from Federal Government

(2)Assumes Division of Highways participation in costs of reverse-lane modifications on Waldo approach.

Projected Disbursements of Funds *(Millions of Dollars)*

	1971-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	Total
Bridge Repairs	2.1	2.3	2.5	3.2	0.0	0.0	2.7	0.0	0.0	12.8
Bridge Improvements	2.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1
Bridge Maintenance and Operating Expenses	4.8	5.2	5.8	6.1	6.5	6.9	7.3	7.8	8.3	58.7
Bus System Capital Costs & Depreciation	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	18.0
Ferry System Capital Costs and Subsidy	10.2	11.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	30.6
Rapid Transit Capital Costs	1.4	7.8	69.4	108.9	80.0	27.0	0.0	3.6	3.4	301.5
TOTAL	31.4	29.8	80.0	120.5	88.8	36.2	12.3	13.7	14.0	426.7

☐ An increase in gasoline taxes, or a sales tax on gasoline, is sometimes proposed as a method of assisting rapid transit. A 1-cent increase in the gas tax in District counties would yield almost $2 million annually under present conditions. This could support additional bonding capacity of roughly $24 million.

☐ A vehicle in-lieu tax, at 2% of vehicle market value, currently yields about $5 million per year for the six counties in the District. An increase in this tax could be applied to the financing of rapid transit, supporting probably another $60 million in bond issuance.

☐ A surcharge is currently being used in some communities to provide financial assistance to local transit authorities. After voter approval, a flat fee is collected from each household with utility bills. Business firms are taxed in the same manner at a higher rate according to the number of employees.

☐ Sales and use taxes are a possible source of financing. A ½-cent sales and use tax for BART financing began April 1, 1970 in San Francisco, Alameda and Contra Costa Counties. This will continue in effect for five years and is expected to provide BART with $31 million in assistance during 1971. Similarly, in Los Angeles, a ½-cent increase was in effect during the last six months of 1970 to make up an operating deficit of the present bus system, and to provide capital improvements for all transit systems in the county.

☐ The use of general obligation bonds to finance local communities' shares of costs for rapid transit requires approval of voters to increase tax levies. Since surplus operating funds from fare-box revenues will be small, the required tax increases on which the voters will have to base their decisions could be substantial.

☐ Several types of Federal grants might be available in addition to what is now provided in the Urban Mass Transportation Act. It is entirely conceivable that additional funding under existing acts or new acts will be made available.

☐ State funds might be potentially available in addition to federal grants. For example, a busway can be financed under the 90/10 federal-state highway program if the busway is viewed as a substitution for increasing the lane capacity of an interstate highway. Since U. S. 101 is not in the interstate system, the 90/10 plan is not presently applicable, although the law might change.

☐ Other programs of the 50/50 type, which apply to primary routes, could potentially be employed and would be particularly suitable for support of exclusive busways.

It appears that a combination of financing methods must be developed to finance the District's long-range transportation facilities plan. It is anticipated, however, that staged development, with initial emphasis on exclusive busways, will provide a greater potential for qualifying for both Federal and State grants.

Because it has managed its resources efficiently, the District is financially able (as shown in the financial tables) to move ahead with its interim bus and ferry systems, but will be unable to implement long-range rapid transit without Federal and other assistance. In this respect, the District's need is similar to that of at least 27 areas in the nation. Yet there is reason to hope that a revived national economy and a revised assessment of national priorities will lead to greater Federal and State assistance for public transportation.

The District's Future Responsibilities

Assembly Bill No. 584 requests in one of its provisions (SEC. 2. (a)) "a definition of the district's future responsibilities for providing transportation services. Alternative proposals are encouraged. Abolishment of the district should be one alternative, in which case recommendations should be made for necessary transfer of powers and duties."

As described in detail throughout this report, the Golden Gate Bridge, Highway and Transportation District is presently managing the Bridge and its traffic, is operating ferry and bus services with expansions planned, and is engaged in planning for long-range transportation facilities in the Golden Gate Corridor.

While many aspects of the District's future transportation plans admittedly will require additional study and continuing, close collaboration with municipalities, state agencies, and the State Legislature, we submit that the Golden Gate Bridge, Highway and Transportation District is efficiently and effectively meeting its enlarged responsibilities.

Because this is true, and because the District has a previous record of competence, the District Directors believe the District should continue as the sub-regional agency responsible for coordinated development and management of a multi-modal, balanced public transportation system in the Golden Gate Corridor.

We agree with the long-range goal of a Bay Area regional transportation authority. But we submit that the Golden Gate Bridge, Highway and Transportation District is achieving this goal in its sub-region. The District is the only sub-regional transportation agency in the Bay Area today that is developing and operating multi-modal public transportation facilities and at the same time has a measure of control over the automobile. Its control of toll levels can influence commuter choices and help subsidize public transportation operations. By controlling all forms of transportation in its sphere of authority, the District can minimize wasteful competition and duplication of transportation modes. Also, the District has the resources to implement its initial and interim improvements.

When a regional transportation authority evolves, the Bridge District is fully capable of fitting smoothly into its organization.

Should the Golden Gate Bridge, Highway and Transportation District be dissolved, another governmental agency with almost identical structure and power would need to be established and organized anew if the goal of an adequate transportation system for the Golden Gate Corridor is to be reached. In that event, the powers, duties, and obligations of the District would be turned over to the successor agency in accord with a schedule to be determined by the Legislature.

An examination to determine the adequacy of the other major existing Bay Area agencies involved in transportation would indicate that each falls short—some to a significant degree—in either power, structure, or experience to perform the functions now within the Bridge District's authority and capability. For example:

☐ *The Metropolitan Transportation Commission.* Its main function is the development and up-dating of a comprehensive regional transportation plan, and approval of applications for grants, in the nine-county Bay Area. It does not have funds, power, or technical staff to finance, implement or operate a transportation system. By the terms of the statutory act creating the Commission, MTC is to turn over its function to another regional agency, if and when one is formed. Meanwhile, the District will be submitting its transportation plan to MTC for review.

☐ *State Division of Bay Toll Crossings.* This agency, governed by the California Toll Bridge Authority through the State Department of Public Works, has been primarily concerned with bridges, and would have the power to operate and maintain the Golden Gate Bridge. It has authorization (Toll Bridge Authority Act 30005 et seq) to acquire and construct other transportation facilities, but it has no experience with multi-modal transportation planning and implementation. It is not governed on the same "home-rule" principles as is the Bridge District and is thus far less accountable or responsive to the regional and county electorates; moreover, its toll revenues are applied on a statewide basis rather than in the Golden Gate Corridor.

☐ *Bay Area Rapid Transit District.* This agency is experienced in construction, and has the statutory power of operation, of rapid transit facilities. It covers only one of the six counties in the Golden Gate Corridor study area, however, and has bonded that County (San Francisco) to its legal maximum. This is a serious limitation which could place a difficult financial burden on Marin, Sonoma, and other counties for new construction. The existing policies governing BART, which require newly annexing counties to "buy in" to existing systems before receiving any commitment to build their own systems, present a serious political and financial obstacle.

Other agencies (Marin County Transit District; Alameda-Contra Costa Transit District; San Francisco Municipal Railway; State Division of Highways) were also examined, but each had even more serious limitations or restrictions for meeting the many-faceted transportation problems of the Golden Gate Corridor.

On the issue of responsiveness, it can be fairly said that none of these agencies would be as responsive to the constituencies of the Bridge District's six counties. These constituencies are the citizens who took the economic risks and invested the funds to build the Golden Gate Bridge. Their Bridge District representatives include, are appointed by, and serve at the pleasure of, the elected members of these counties' Boards of Supervisors and other directly elected officials. There could, in fact, be no more responsive type of governance short of choosing District Directors by direct election.

There is not really a reasonable case for abolishing the Golden Gate Bridge, Highway and Transportation District.

The Golden Gate Bridge, Highway and Transportation District is the only multi-county transportation agency in the Bay Area with the comprehensive power and experience to plan, finance, and operate buses, ferries, rapid transit, and bridges in the Golden Gate Corridor.

It is already a "regional" transportation agency. It should continue to be, with the power to plan, finance, implement, and operate a balanced, multi-modal system of Bridge and public transit, and to contract and cooperate with public entities and public agencies to accomplish objectives.

In meeting our future responsibilities, we look forward to the guidance and the close cooperation of the California State Legislature.

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